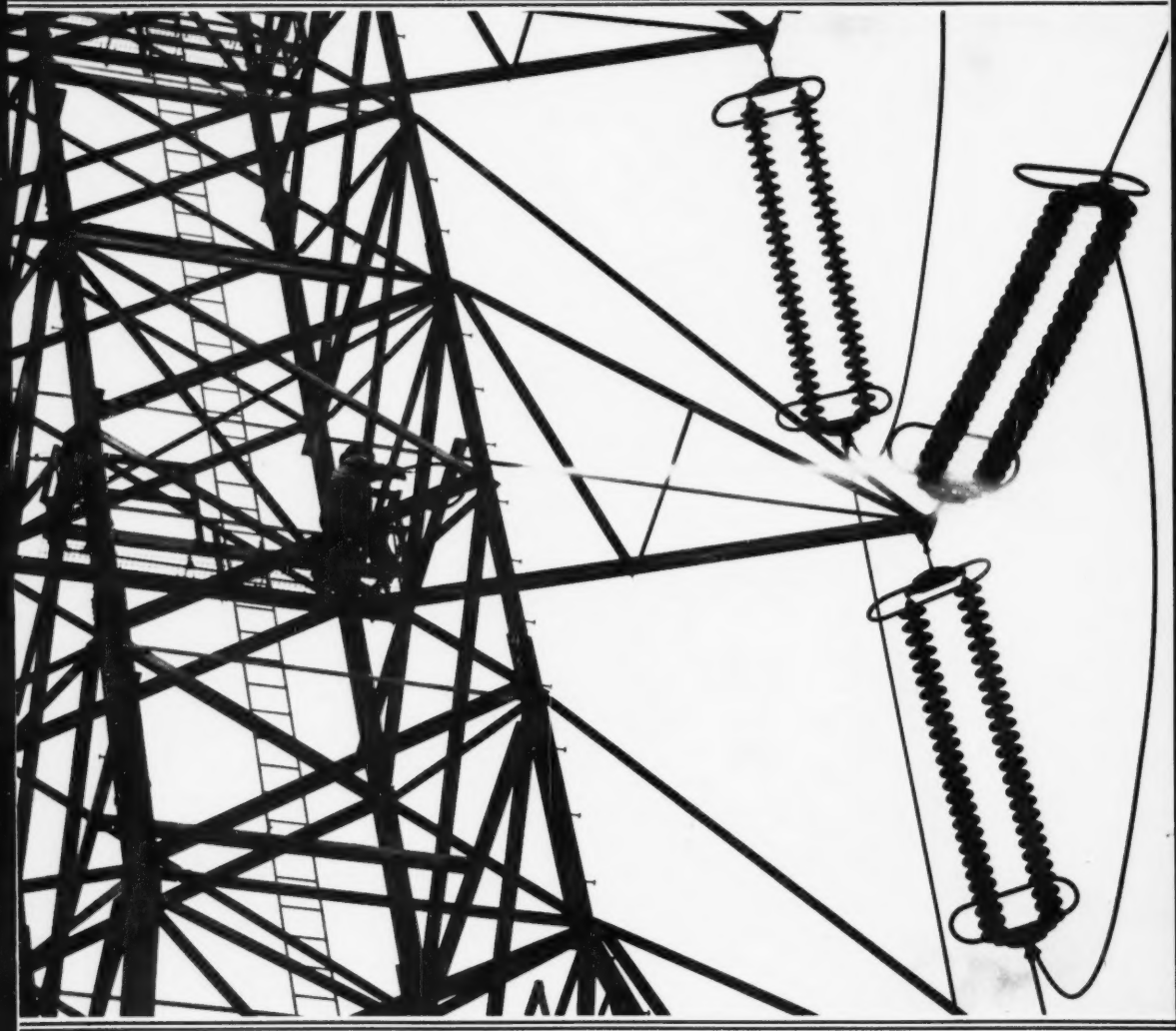
ELECTRICAL WEST

Part 1

April 1949

50 Cents



Manufacturers' Directory Issue

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

OFITS IN PROSPECT!

On the figures, it looks like a profitable year for alert electrical appliance dealers. Last year, 70,000 new customers were added to Edison lines, and more thousands are being added every month. These are *your* customers, too – thousands of new prospects for appliance sales, in addition to the huge existing market.

Of course, conditions are changing. These are good prospects, but you'll have to *sell* them! As always, Edison will help, with planned promotional programs to boost your sales. The material is new, but the basic pattern hasn't changed: it's still "Edison tells them and the dealer sells them!"

See Edison Dealers News for full details.

It shows you how to tie in, to cash in!

SOUTHERN CALIFORNIA EDISON COMPANY

How attractive can a Substation be?

Maybe you've hesitated to take advantage of the many benefits of locating your substations close to the load because you were afraid of the reaction of placing substations in residential districts.

Other utilities felt the same way too, until they investigated the advantages of G-E unit substations outlined by our engineers.

They were told that substations literally can be "dropped" in anywhere on the system to take care of present and future load demands.

And with a little incidental landscaping, the substations became an inconspicuous part of the community.

We'd like to show you more examples of how other utilities integrated G-E unit substations into their planning. We'd also like to tell you about the many advantages—such as lower costs and increased reliability—of G-E load center power distribution. Give us a call at the office, or write for brochure GEA-5155 that shows how other utilities took advantage of G-E engineering and service. *Apparatus Department, General Electric Co., Schenectady 5, N. Y.*

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

APRIL 1949

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.
The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal", "Journal of Electricity, Power and Gas" and "Journal of Electricity". Contents copyright, Sixty-second year of publication

ELECTRICAL WEST

James H. McGraw (1860-1948), Founder
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W. A. Cyr, Associate Editor — Walter C. Heston, Engineering Editor
Peggy Boyer, Assistant Editor — R. A. Balzari, Publishing Counselor
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For May

The controversial Columbia Valley Authority matter is again in the limelight with a bill due to be introduced in Congress soon. We hope to have an article in the May issue on the subject, "Why We Don't Need a CVA," by an informed industry leader in the Northwest. Regional power costs will be discussed in a staff article to show that a proposed Northwest - California transmission line might siphon low - cost power away from the Northwest area. Newly drawn minimum requirements for customer owned service poles will be presented diagrammatically. We expect also a feature on an automatic 110-kv. sectionalizing switch installation. There will be a digest of papers presented at the recent regional IES conferences at Portland and Seattle, as well as a pictorial account of the Electrical Maintenance Engineers' Assn. exhibit at Los Angeles. Information will be presented on a new totally indirect fluorescent lighting fixture developed for the new addition to Pacific Gas and Electric Co.'s office building in San Francisco. There will be two Northwest association data sheets on commercial heating applications; another in the series on power factor data sheets; lighting ideas, association news, the news letter, and the sales guide as regular features.

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Cover photo: Washing 287-kv. insulators hot on system of Los Angeles Department of Water & Power.

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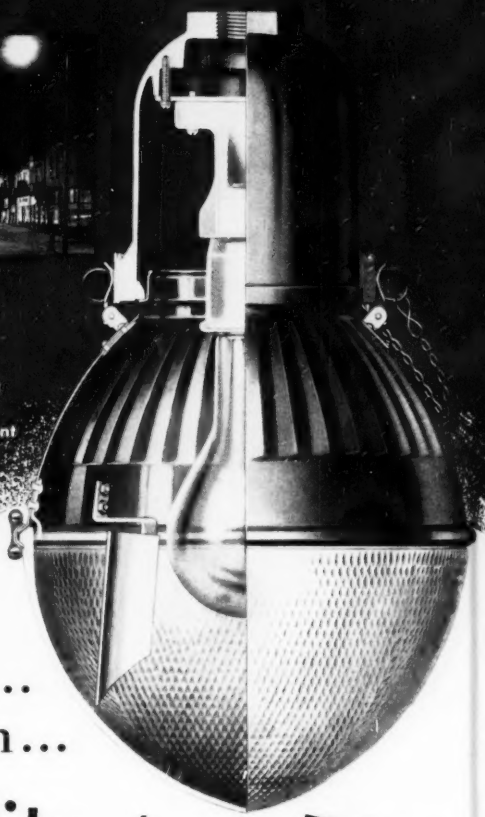
Progressive Towns Re-Light for Safety

These "before" and "after" photos show how one eastern city tripled the illumination with L-M Spherolites. Formerly, light on the pavement was .64 lumens per square foot; with Spherolites it is 1.8—and with the same size and number of lamps. Same total wattage—but more efficient utilization of light. And, says the superintendent, there is less breakage, less cleaning, and maintenance costs are substantially lower. Not bad!



Safety goes up... maintenance goes down... with L-M Spherolite

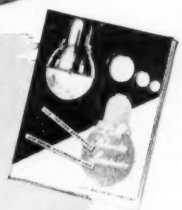
Spherolite luminaires direct a high percentage of the light onto the pavement, spreading the light over a wide area, in a controlled pattern. Here are some Spherolite features:

Versatility: adaptable to all mounting requirements; wide variety of metal hoods, porcelain heads, glassware, holders, deflectors.

Low Maintenance: dust and moisture seals between glass and reflector and hood; easily accessible for relamping. Hoods sealed against dust, moisture insects. L-M fluted reflector by-passes the light around vertical axis of lamp, avoiding heat concentration and assuring full lamp life.

Long life: weather-tight construction maintains reflector efficiency for many years; aluminum and other non-corrosive materials assure long life; heat-barrier hoods prevent cable deterioration.

Engineering Service: need help? ask for an L-M Street Lighting Engineer—trained, experienced men who help you get safe, efficient street lighting to fit your budget.



Want to Know More?

Write for L-M's new Spherolite bulletin. Photometric data, I.E.S. recommendations, and other useful information. Details on Spherolite construction and application, on hoods, glassware, standards, brackets, accessories, and control equipment including L-M "Wired Radio" control. Ask any L-M field engineer or **write Line Material Co., Milwaukee 1, Wisconsin.**

LINE MATERIAL Street Lighting

L-M DISTRIBUTION EQUIPMENT INCLUDES: Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters • Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Fibre Conduit • Street and Airport Lighting Equipment • "Wired Radio" Control Equipment • Capacitors

YOU CAN BE SURE.. IF IT'S
Westinghouse

PROOF
FROM
IOWA

"We no longer purchase conventional transformers"

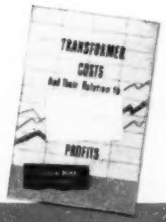
This testimony of a midwestern operator is backed by his own service records that show "CSP"* Completely Self-Protecting transformers produced these benefits for him:

"lower distribution cost per dollar invested...fewer service trips...better lightning protection . . . fewer transformer burnouts"

Mark this down as sure: complete self-protection *built in* means less dollar investment for distribution facilities. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-70522

**Trademark—Reg. U. S. Pat. Off.*

PROVE IT YOURSELF with this new book that lets you compare Completely Self-Protecting transformers with conventional types—using your own figures for original investment, installation maintenance, depreciation and interest. Ask for B-4247, "Transformer Costs and Their Relation to Profits".



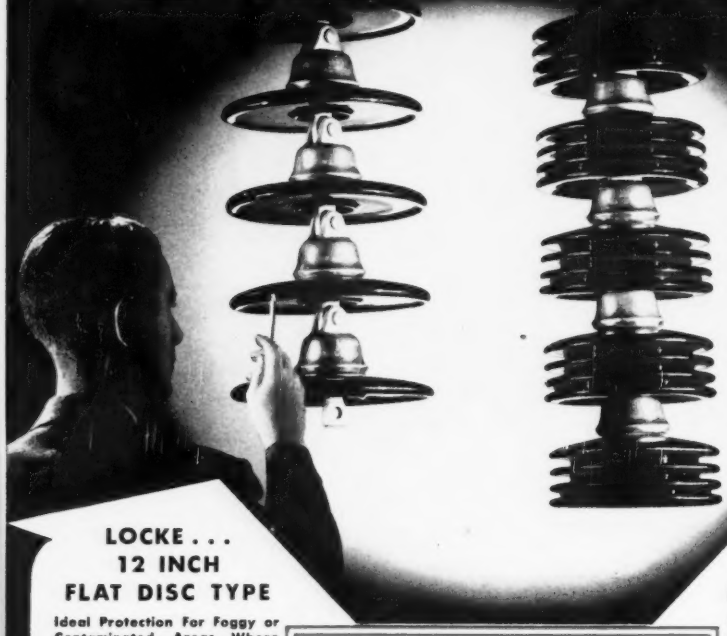
Call the Westinghouse Salesman

Westinghouse "CSP" TRANSFORMERS

SINGLE PHASE THREE PHASE BANKED SECONDARY

For CONTAMINATED Areas-

6 Point FLASHOVER Protection with LOCKE FOG-TYPE Insulators



LOCKE . . . 12 INCH FLAT DISC TYPE

Ideal Protection For Foggy or Contaminated Areas Where *Washing* Wind and Rains Are *Frequent*.

1. Full 12 Inch Shell Diameter assures plenty of clear arcing distance.
2. No Deep Corrugations or Undercuts mean no dirt traps.
3. Smooth surfaces easily cleaned by wind and rain.
4. Open leakage distance, 10¼ inches, simplifies natural and manual cleaning.
5. Large vertical drip distance minimizes possibility of flashover during rainstorms.
6. Small corrugations at pin form barrier on underside which minimize ionized streamers.

When contamination is a major problem, use Locke Fog-Type insulators. You'll find they're especially effective in severely contaminated areas where film deposits—moistened by fog, dew or light rain—can cut insulator flashover voltage by as much as 80%.

Locke Fog-Type insulators are made of rugged porcelain with Compression Glaze. Large diameter pins reduce leakage current concentration at cement line and minimize any tendency to corrode or pit the pin. Ample space between units is provided for hot line maintenance work.

Next time you're up against a contamination problem, get Locke Fog-Types.

"Distributed by General Electric Supply Corporation"

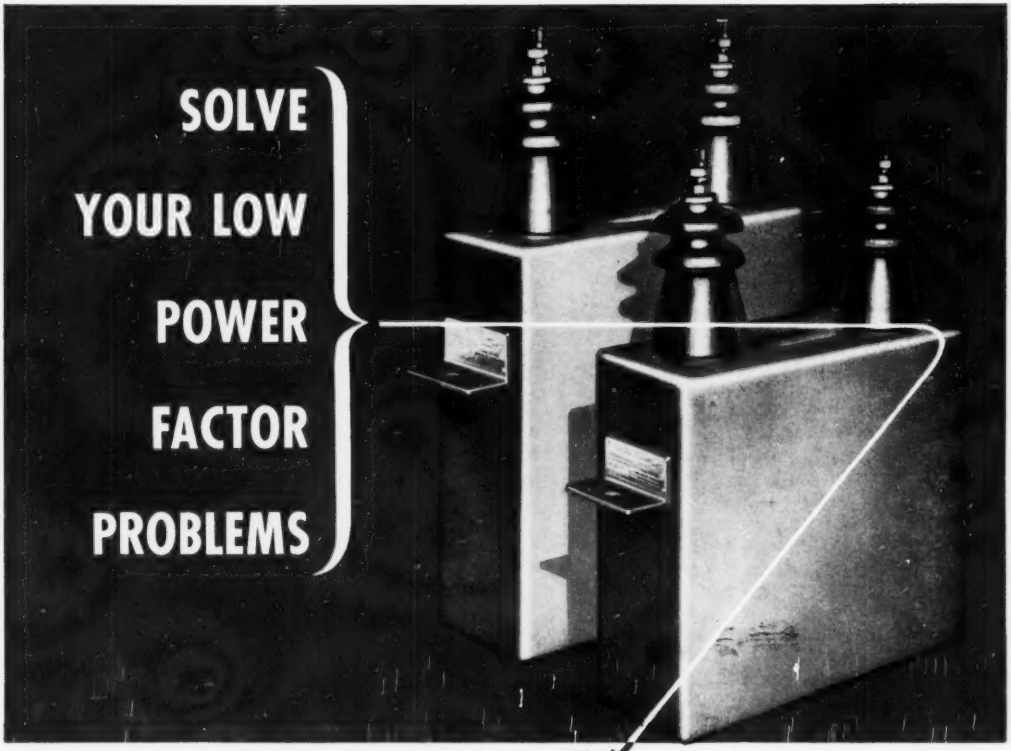
LOCKE
INCORPORATED
BALTIMORE, MARYLAND

. . . LOCKE 10 INCH MULTI-SKIRT TYPE

Ideal For Foggy or Contaminated Areas Where *Washing* Wind and Rains Are *Not Frequent*.

1. Larger shell diameter provides greater arcing distance.
2. No undercut in outside corrugations permits easy cleaning by wind and rain.
3. Vertical skirt inside shell provides additional *protected* leakage distance.
4. Leakage distance balanced with parallel arcing paths means efficient utilization of full 18" leakage distance.
5. Less shell depth provides greater vertical drip distance.
6. Small corrugations at pin minimize ionized streamers.

Before you buy STOP! See what Locke's Got . . .



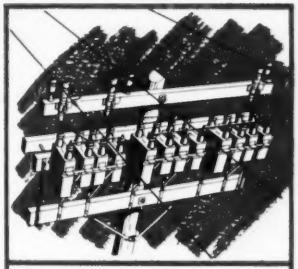
with MOLONEY *Capacitors*

Reduce reactive Kva by using shunt capacitor installations and increase your distribution system's ability to handle "pay" load. Proper use of capacitors will release generator, transformer and feeder line capacity that is now tied up with non-revenue producing reactive Kva. Further dividends are provided by capacitors in lowered line losses and decreased line voltage drop.

Moloney Capacitors are designed to give long, trouble-free service. They are built to the same high standard of quality that is characteristic of Moloney Transformers.

MOLONEY CAPACITOR FEATURES

- ★ Long life through high impulse strength and low unit voltage stress.
- ★ Copper-bearing steel cases—welded construction (16 gauge). Domed top to shed water.
- ★ Hermetically sealed to prevent entrance of moisture. Tanks are pressure tested for leaks.
- ★ Vacuum treated under elevated temperature to remove moisture and air. Then they are impregnated and filled with non-inflammable Askarel liquid. Suitable for outdoor or indoor installation.
- ★ Solderless type terminals arranged to take two conductors ranging from No. 8 solid to No. 2 stranded, permitting convenient connection in banks.



Capacitors provide the quickest and most economical means of relieving system overloads and improving voltage conditions where low power factor loads prevail. Capacitors may be obtained from stock, and installed costs are low...less than $10 per Kvar.

MOLONEY ELECTRIC COMPANY

Sales offices in all principal cities

FACTORIES AT ST. LOUIS 20, MO., AND TORONTO, ONTARIO, CANADA

"IT'S EASIER TO WORK WITH DIEFLEX"

VARNISHED TUBING PRODUCTS

. . . because Dieflex Tubing and Sleeving have the qualities that make assembly work easier—flexibility, smooth bore, good push-back, and non-frayability. Let your operators work with Dieflex and you will see the difference . . . see how it saves lost motion, lost time, and needless aggravation.

Engineers like Dieflex, too, because of its uniformly complete impregnation and high dielectric strength. There is a Dieflex product for every tubing and sleeving requirement—with a base of either finely braided cotton or glass fibre, impregnated with oleoresinous varnish or silicones, as your applications may require.

We would like an opportunity to show you how much Dieflex can reduce your assembly costs—will you let us?

DIEFLEX PRODUCTS LIST

MADE WITH BRAIDED COTTON SLEEVING BASE

Grade A-1 Magneto Grade Varnished Tubings
Grade B-1 Standard Grade Varnished Tubings
Grades C-1 and C-2 Heavily Coated Saturated Sleevings
Grade C-3 Lightly Coated Saturated Sleevings
Heavy Wall Varnished Tubings and Saturated Sleevings

MADE WITH BRAIDED GLASS SLEEVING BASE

Grade A-1 Magneto Grade Varnished Fiberglas Tubings
Grade C-1 Extra Heavily Saturated Fiberglas Sleevings
Grade C-2 Heavily Saturated Fiberglas Sleevings
Grade C-3 Lightly Saturated Fiberglas Sleevings
Silicone-Treated Fiberglas Varnished Tubings and Sleevings

TRI-STATE SUPPLY CORPORATIONS

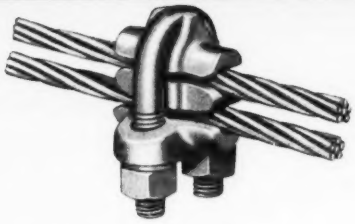
LOS ANGELES 13	SAN FRANCISCO 7	SEATTLE 4
544 S. San Pedro St.	554 Bryant St.	318 Occidental Ave.
MUtual 2354	EXbrook 2-8890	MAin 4161

These L-M Clamps help you...

get lines up Quicker

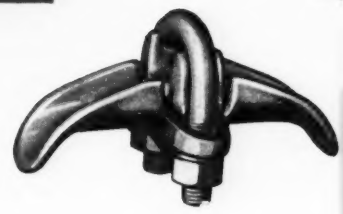
...keep them up Longer

CONDUCTOR CLAMPS



U-Bolt Clamps Nos. CL9X for dead-ending aluminum and copper conductors. In four sizes; aluminum or bronze clamps with galvanized steel U-bolt; or all in everdur bronze. For aluminum, No. 4 solid to 336,400 CM; copper, No. 8 to 4/0; stranded copper from No. 8 to 350,000 CM.

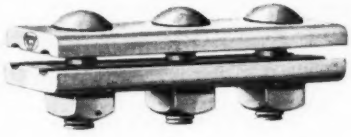
Double Groove Clamp No. CL-10X in aluminum, with plain or copper liner, or in all bronze or all copper, for tap-offs and connections. Square shank bolt in square hole in clamp prevents turning. Bolts and nuts galvanized steel. Four sizes in each type, for wire from No. 12 to 300,000 CM.



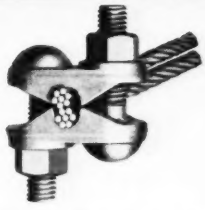
Suspension Clamps Nos. 905 and 906 have the correct curve for semi-tension use in angle work, and have a very wide range of applications. Forged steel, heavily galvanized. Two sizes, 4⅛" for No. 6 solid to 4/0 AWG stranded cable; and 6⅛" long for No. 6 solid to 350,000 CM.

GUY CLAMPS

Strain Clamp No. 907: heavily galvanized forged steel, is light in weight but has extremely high tensile strength. Reversible tongue with grooves of various depths to give proper contact with sizes from No. 6 solid to No. 4/0 AWG stranded cable.



Guy Clamp No. 9493—Heavily galvanized steel, in light or heavy designs, 1 to 4 bolts. Both plates have square holes so the square shank bolts may be inverted but won't turn when the lineman tightens them.

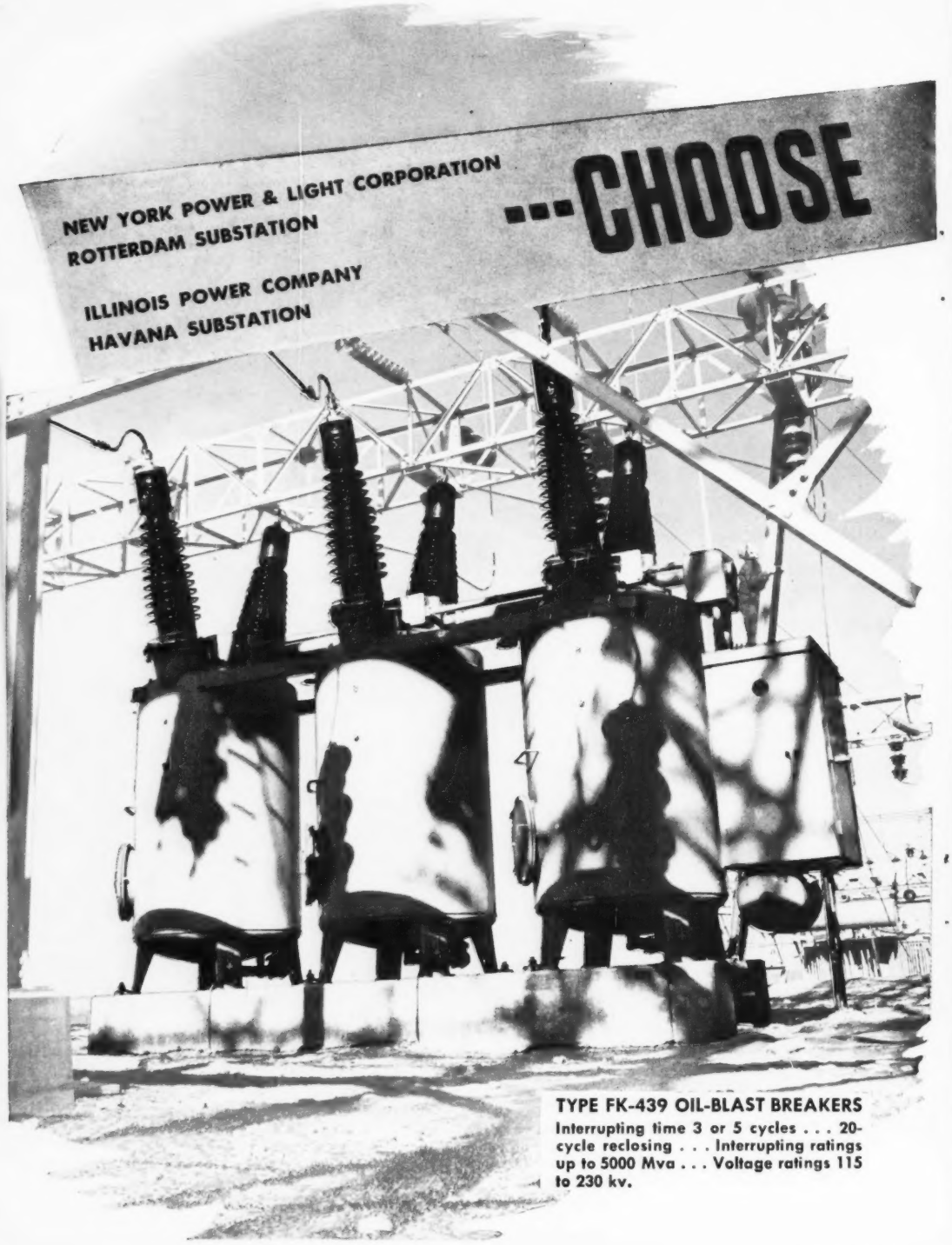


Universal Guy Clip No. CL-117X: special L-M design. Square bolts in square hole, opposed for full 360-degree turn of wrench. Long non-slip grooves, large gripping area, well rounded corners. Five sizes for ¼ to ½-inch wire.

For details on these and many other L-M Clamps, ask the L-M Field Engineer, or **write Hardware Division, Line Material Company, Milwaukee 1, Wisconsin.**

LINE MATERIAL Pole Line Hardware

Complete Coordinated Equipment for all Distribution Requirements



TYPE FK-439 OIL-BLAST BREAKERS

Interrupting time 3 or 5 cycles . . . 20-cycle reclosing . . . Interrupting ratings up to 5000 Mva . . . Voltage ratings 115 to 230 kv.

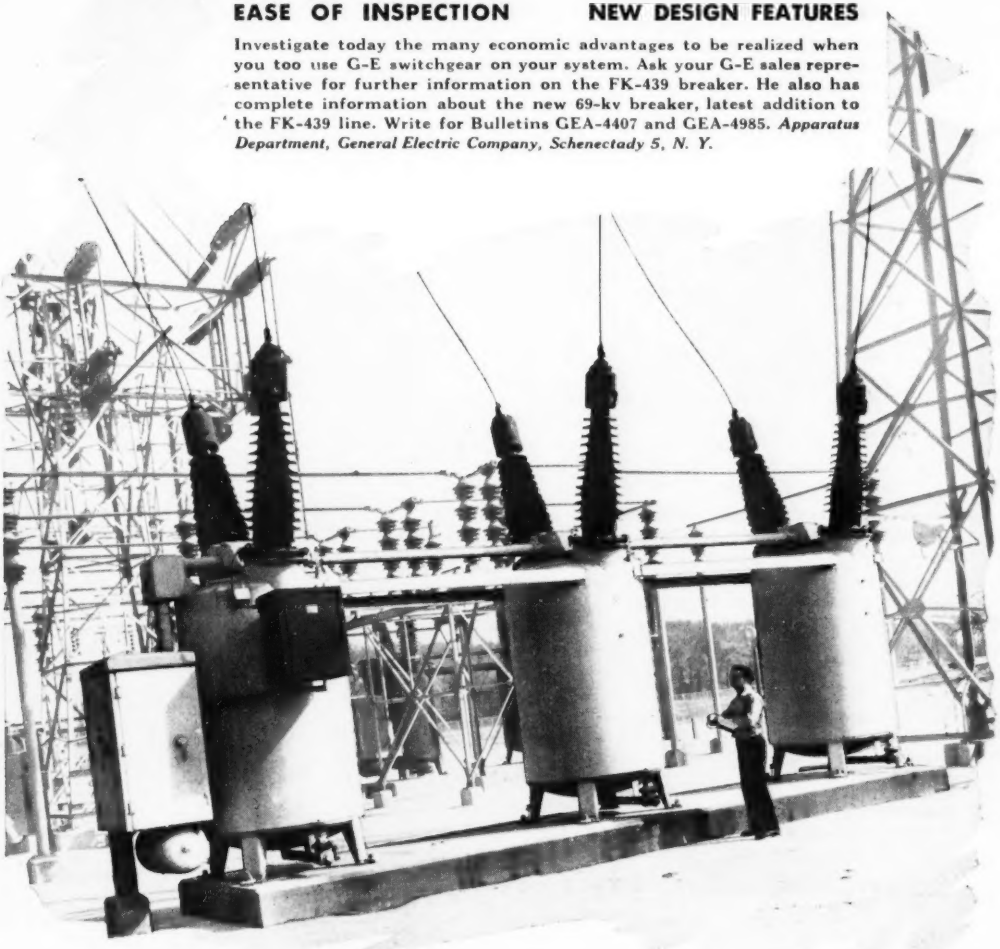
HIGH-VOLTAGE BREAKERS

FOR

20-CYCLE RECLOSING
NEW SEALED BUSHINGS
EASE OF INSPECTION

3 OR 5 CYCLE HIGH-SPEED INTERRUPTION
NEW DESIGN FEATURES

Investigate today the many economic advantages to be realized when you too use G-E switchgear on your system. Ask your G-E sales representative for further information on the FK-439 breaker. He also has complete information about the new 69-kv breaker, latest addition to the FK-439 line. Write for Bulletins GEA-4407 and GEA-4985. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*



GENERAL ELECTRIC

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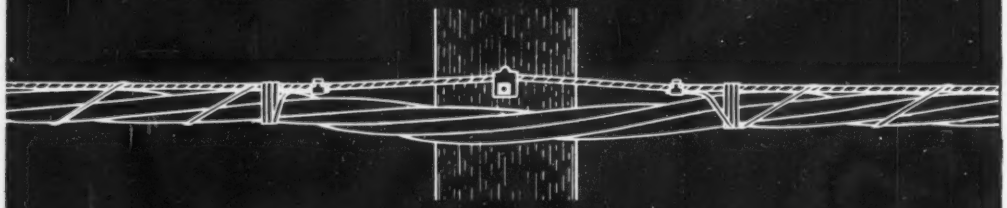
OKOLITE-OKOPRENE



SELF-SUPPORTING AERIAL CABLE

...the storm-safe, low-cost improvement over open wiring

Insulated aerial power cables time and time again have reduced circuit outages during sleet storms, floods and hurricanes. They require no attention under such conditions. When insulated aerial power cables are used for important feeder or vital overhead sections, storm repairs on main circuits are avoided and linemen can direct immediate efforts toward getting service reestablished for essential customers.

Okolite-Okoprene Self-Supporting Aerial Cable with in-built messenger is a cable assembly that can be installed in a single operation . . . no separate stringing of messenger or placing of rings. It is widely used for overhead lines, for industrial services, circuits between buildings and for indoor use supported from beams and trusses. Okonite's patented "Dualay" assembly permits tapping "hot" on lines operating up to 5000 V.

A 52-page manual, Bulletin WE-1033 gives you pictures, figures and facts about Okolite-Okoprene Self-Supporting Aerial Cable. Here is complete engineering information . . . sag and tension data . . . current carrying capacities . . . ice and wind loadings, page after page of photographs and diagrams of installation, tapping, splicing. For a copy, write on your business letterhead to The Okonite Company, Passaic, N. J.

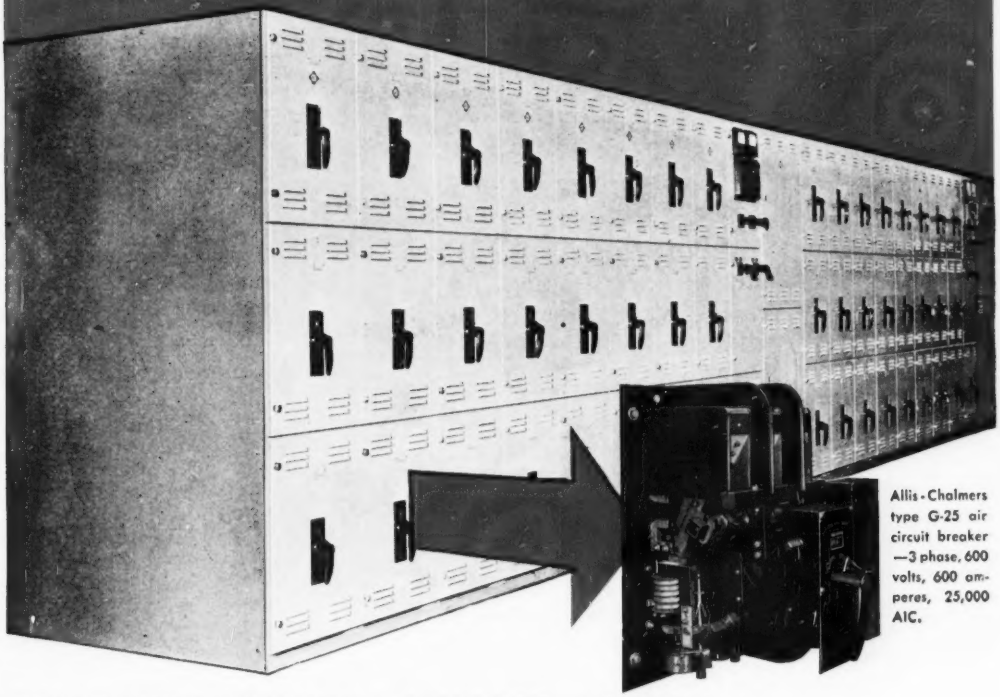
REDUCES OUTAGES DURING STORMS

THE BEST CABLE IS YOUR BEST POLICY

OKONITE SINCE 1878

insulated wires and cables

ALLIS-CHALMERS LOW VOLTAGE METAL-ENCLOSED SWITCHGEAR



Allis-Chalmers type G-25 air circuit breaker —3 phase, 600 volts, 600 amperes, 25,000 AIC.

MODERN INSTALLATIONS NEED

Modern Protection!

NEW INSTALLATION DESIGN demands *modern* switchgear . . . inside and out! On both counts you can depend on Allis-Chalmers metal-enclosed low voltage units.

You Save on Installation

Low voltage units are factory assembled and completely wired for easy installation . . . just bolt them down, complete cable connections and put into operation. Maintenance is easier, too, because adjacent circuits need not be disturbed when inspecting drawout units. Simply replace the withdrawn breaker with a spare and the circuit is back in operation.

Dependable Interruption

Allis-Chalmers type G air circuit breakers are insensitive to shock and vibration under normal duty. Allis-Chalmers low voltage switchgear is available for 600 volts a-c and below where 15,000 to 100,000 amperes interrupting capacity is required.

For more details call your nearest A-C office or write direct.

A 2591

ALLIS-CHALMERS, 939A SO. 70 ST. MILWAUKEE, WIS.

ALLIS-CHALMERS

First in the U. S. with Metal-Clad Switchgear

Stretch it overhead

OVERHEAD POWER

Type MS Self-Supporting Aerial Cable for power distribution has many advantages over open wire lines. It is safer and more dependable . . . less subject to damage by storms, lightning and falling limbs. It practically eliminates expensive tree trimming and looks better in residential areas. What's more—voltage regulation is improved and interference with radio and television is prevented by the conducting Neoprene sheath.

Aerial Cable One to four insulated conductors coiled around a messenger strand which provides mechanical support and also serves as the neutral conductor in grounded neutral circuits. Shielding of conducting rubber is recommended for all cables rated above 600 volts.

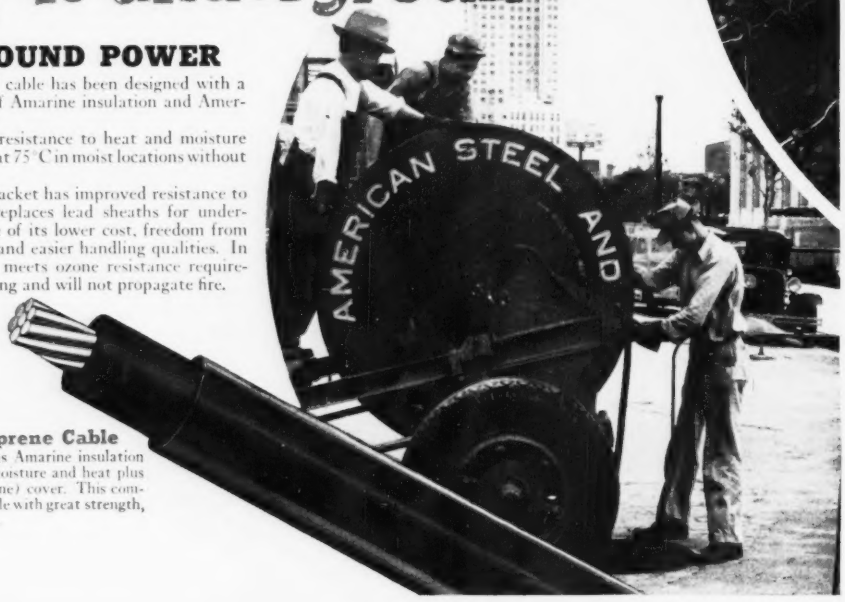
Bury it underground

UNDERGROUND POWER

For this use a special cable has been designed with a happy combination of Amarine insulation and Amerprene cover.

Amarine has high resistance to heat and moisture permitting operation at 75°C in moist locations without deterioration.

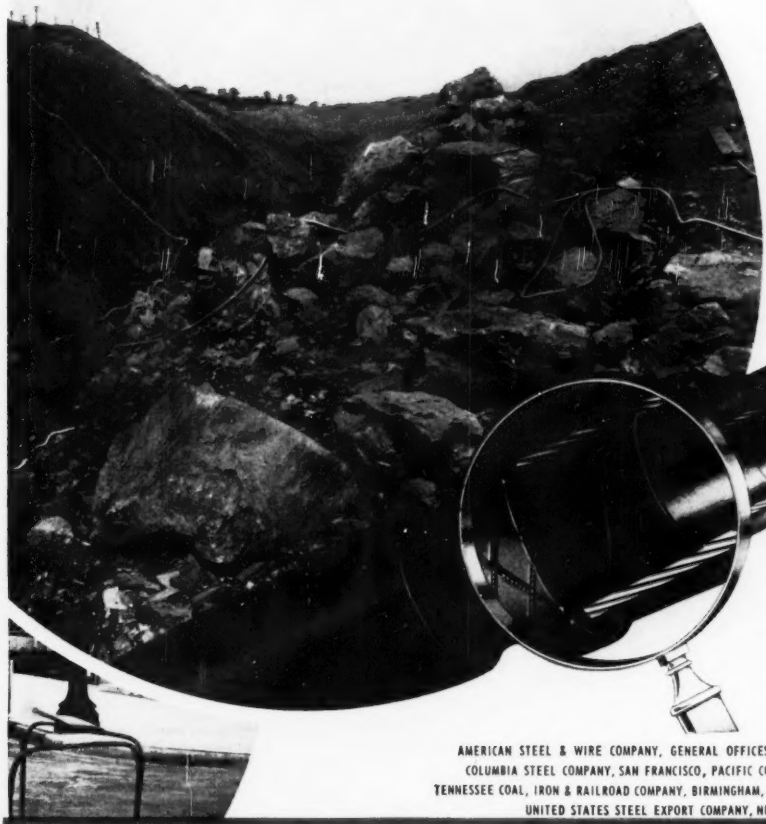
Amerprene in the jacket has improved resistance to moisture or oil. It replaces lead sheaths for underground cable because of its lower cost, freedom from electrolysis troubles, and easier handling qualities. In addition, Amerprene meets ozone resistance requirements, is flame resisting and will not propagate fire.



Amarine-Amerprene Cable for underground use has Amarine insulation for high resistance to moisture and heat plus an Amerprene (Neoprene) cover. This combination produces a cable with great strength, toughness and long life.

American Rubber-Covered Cable is designed for superior service in any of these applications

Drag it over the surface



SURFACE POWER

For all types of portable machines from the largest power shovel to the smallest power drill, specially designed Amerclad Cables are noted for their ability to stand rugged service.

Covers are usually made of Amerprene for its high resistance to oil, acids, abrasion, cracking and aging. Interior insulation is Amerite, a high grade, performance-type rubber insulation. Conductors are flexible copper strand with each wire alloy coated.

Type G Three-Conductor Amerclad Shovel Cable

Designed for maximum safety with three ground wires. PS flexible non-metallic shielding is provided for voltages between 2000 and 5000.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

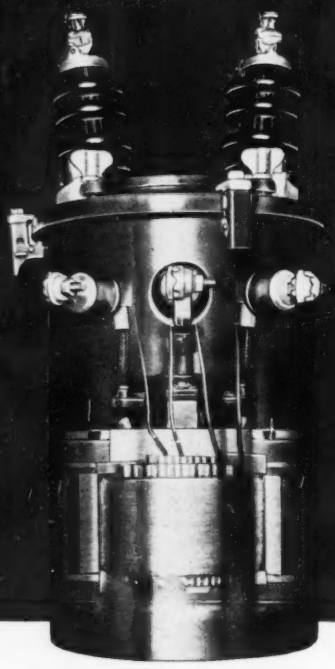
USS **AMERCLAD CABLES**

UNITED STATES STEEL

MOLONEY

HiperCore

DISTRIBUTION TRANSFORMERS



15 TO 30% LIGHTER

SMALLER SIZE

GREATER SHORT-TIME OVERLOAD CAPACITY

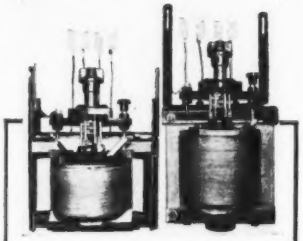
BETTER VOLTAGE REGULATION

Moloney HiperCore Transformers have cores of cold-rolled, high permeability, oriented silicon steel. The improved characteristics of this core material make possible reductions in transformer size and weight, better voltage regulation and increased short-time overload capacity.

Reductions in size and weight range from 15% to 30%. Because they are smaller and lighter, HiperCore Transformers are more easily and quickly installed on the poles . . . are easier to handle and take up less space on the line truck and in the storeroom.

Through lower impedance, better voltage regulation is possible at all loads with HiperCore Transformers. This means greater customer satisfaction . . . because of reduced secondary voltage fluctuations during sudden or intermittent load changes . . . and because of decreased voltage drop during peak load periods.

HiperCore Transformers have improved short-time overload characteristics which provide better peak load performance and longer life. Reduced coil mass, together with extensive use of cooling ducts, results in more rapid cooling of the windings and in a lower hottest-spot temperature gradient.



HiperCore core-and-coil unit and conventional type core-and-coil unit. Both are rated 3 Kva, 12470 Gr. Y/7200-120 240 volts. Smaller size of HiperCore unit achieved by use of wound cores made of high permeability, oriented, silicon steel.

MOLONEY ELECTRIC COMPANY

Sales offices in all principal cities

FACTORIES AT ST. LOUIS 20, MO., AND TORONTO, ONTARIO, CANADA

American MOTOR LEADS

are insulated and protected with NATVAR 400

The compact 1 HP single phase 115/230 volt, capacitor start—induction run motor, manufactured by American Electric Motors, Inc., Los Angeles, is especially recommended for use around dirt or dust-filled machines such as table saws or other woodworking tools. The centrifugal starting switch is totally enclosed, and the solid welded copper bar armature is mounted on high quality, standard size ball bearings, lubricated for life. Leads are insulated and protected with Natvar 400.

American Electric Motors, Inc., Los Angeles, manufactures a line of induction motors, both single phase and polyphase, and a line of grinders and buffers. An excellent indication of their performance and value is the fact that they are widely distributed by a principal mail order chain.

Natvar 400 Extruded Vinyl Tubing is used on motor leads, because it is approved for 105°C continuous operating temperatures, it simplifies assembly, and gives better all around insulation and protection with considerable savings in labor and material costs and reduced waste.

Natvar 400, in addition to its ability to withstand heat, also has uniformly superior resistance to oil. It is available for prompt delivery either from a nearby wholesaler's stock or direct from our own. Full Underwriters' Laboratories report on request.

Natvar Products

- Varnished cambric—straight cut and bias
- Varnished cable tape
- Varnished canvas
- Varnished duck
- Varnished silk
- Varnished special rayon
- Varnished Fiberglas cloth
- Silicone coated Fiberglas
- Varnished papers
- Slot insulation
- Varnished tubings and sleevings
- Varnished identification markers
- Lacquered tubings and sleevings
- Extruded vinyl tubing and tape
- Extruded vinyl identification markers

Ask for Catalog No. 21

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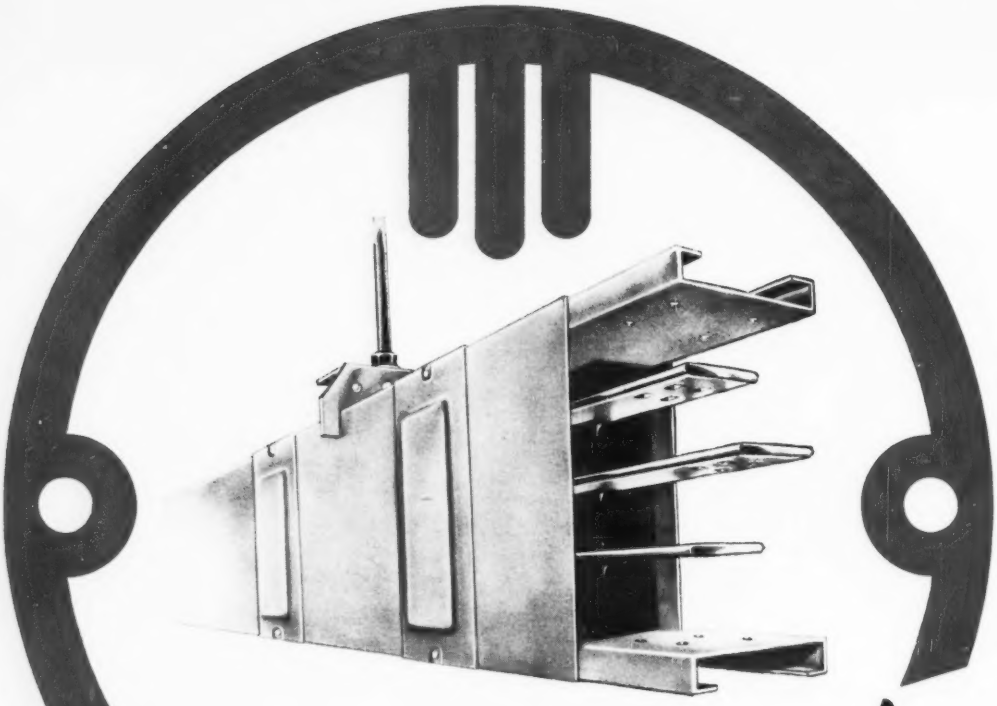
THE NATIONAL VARNISHED PRODUCTS Corporation

TELEPHONE RAHWAY 7-2171

CABLE ADDRESS NATVAR: RAHWAY, N. J.

233 RANDOLPH AVENUE ★ WOODBRIDGE NEW JERSEY



Outlets every foot!

Plus greatest plug-in safety . . . Federal Noark Bus Duct

FOR PLUG-IN POWER where you want it, when you want it, be sure you get the *extras* that come in industry's "convenience outlets"... Federal Noark Bus Duct. Utmost flexibility...insulated openings for complete safety in applying and removing plug-in devices.

Federal Noark Bus Duct has four-channel strength—sides, top and bottom are all rigid. Rugged bus bar insulators are mounted on 12" centers for high electrical safety and mechanical strength. Adjustable hangers reduce both installation time and cost. Contacts at bolted connections are silverplated.

See your Federal Distributor about Federal Noark Bus Duct. And write us for your copy of Bulletin 180 giving full descriptions and data. Federal Electric Products Company, 50 Paris St., Newark 5, New Jersey.

FEDERAL NOARK BUS DUCT

Complete line of Federal Electric Products includes Motor Controls, Safety Switches, Service Equipment, Circuit Breakers, Panelboards, Switchboards, Bus Duct ★ Sales offices in principal cities.

General Electric Watthour Thermal Demand Meter, Type IHM-1

accurate, economical measurement of small demands

With the Type IHM-1 Watthour Thermal Demand Meter you are assured of accurate, economical measurement of small demands.

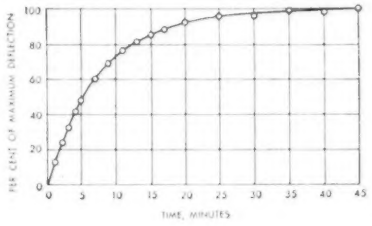
THE THERMAL DEMAND ELEMENT operates on the "direct heat" principle. Because of the resulting high efficiency, a greater torque is produced. This makes possible the use of larger, sturdier parts; you get greater reliability and lower maintenance costs.

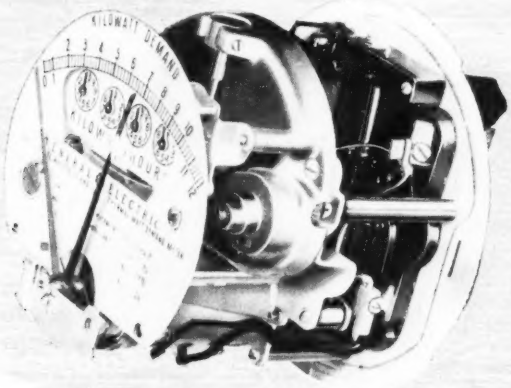
Another advantage of the "direct-heat" thermal element is that heat transfer between the heater and spirals is eliminated. As a result, the meter will not overshoot on transient loads—response time can be easily predicted—shorter testing time is possible.

THE WATTHOUR METER ELEMENT is a "wide-limit" meter—equally accurate at high and low loads. It has braking magnets die-cast in the frame, and a relief gap that provides a controlled breakdown point.

Since the IHM is essentially two meters in a single case you will find it provides a valuable saving in space. You will also save on installation costs because it fits standard watthour meter sockets and bottom connected installations.

To give you more facts, figures, diagrams, and pricing information on the "S" and "A" types, there's a new bulletin (GEC-408). Get a copy from your nearest G-E sales representative. Or write to *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*





GENERAL ELECTRIC

601-44

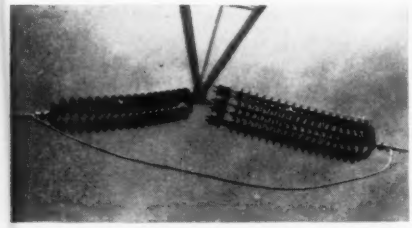
With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

BTC

FORGED STEEL HI-LINE HARDWARE

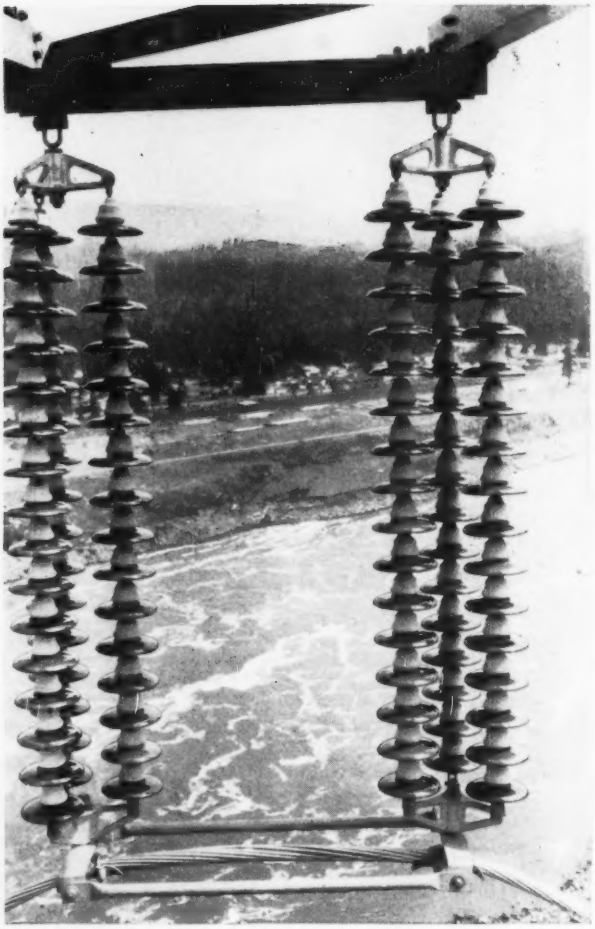
Used on Another Important Transmission Line

Sold only through your insulator manufacturer



Conductor dead-ending at Bradford Island Crossing was through Six-String Strain Yoke Sets using springs to equalize Insulator String tension. Triple Strain Yoke Sets were used on the inland side of towers.

One of the Dead-End Towers showing Triple Strain Yoke Sets and Jumper Suspension Strings.



The suspension construction at Bradford Island Crossing used two high strength forged steel clamps each connected to Yoked Triple Insulator Strings.

The Bonneville-Vancouver line is but one link in the Bonneville Power Administration's extensive transmission line network which has been an important factor in the development of the Pacific Northwest.

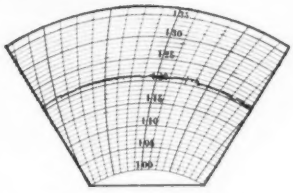
This 230 kv. line, built in 1939, is 35.6 miles long. The conductor, except for the river crossing described below, is 795,000 cm. A.C.S.R., supported, at 12750 pounds tension, on steel structures. At the Bradford Island Columbia River Crossing the special 801,900 cm. A.C.S.R., under 26,000 pounds tension, is suspended on high river-bank towers and dead-ended on next adjacent inland towers.

All Suspension Clamps, Strain Yoke Sets, and Fittings by BTC. Service record has been very satisfactory.

THE BREWER-TITCHENER CORPORATION, CORTLAND, NEW YORK

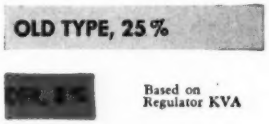
4 Reasons Why You Get Closer Regulation ...Lower Operating Costs with Allis-Chalmers 5/8% Step DFR* Regulators!

REASON 1



Maintains voltages within ±¾ volt. Simpler, closer regulation made possible with *Feather Touch Control* which follows line fluctuations without damping effect . . . and *Voltage Integrator* which sums up and balances out fluctuations of short duration.

REASON 2



Requires only ⅓ the excitation of other types! Low exciting current releases system capacity for useful loads (specific information available).

REASON 3

Regulation	Amp. Capacity*
±10%	100%
±8¾%	114%
±7½%	133%
±6¼%	160%
±5%	200%

*400 amps. max.

Up to 200% base current capacity in as many as five intermediate steps. Simple 30-second *Vari-Amp* adjustment adapts regulator to increased load current of growing power demand (with corresponding adjustment in regulation range).

REASON 4

*DFR — station type single phase regulators

Proved low maintenance. Hundreds of thousands of tap changes under actual service conditions . . . these are records made possible through (1) balanced spring tap changing mechanism, (2) small ⅝% steps, and (3) *Elkonite* RS-1045 contacts.

You can *boost load capacity* of feeders, *increase revenue,* and *improve customer good will* by controlling line voltages with Allis-Chalmers ⅝% step regulators. Have your A-C sales representative call and discuss these regulators in terms of specific advantages to your system. Or write direct.

ALLIS-CHALMERS, 939A SO. 70 ST. A-2671
MILWAUKEE, WIS.

Vari-Amp is an Allis-Chalmers Trademark

ALLIS-CHALMERS

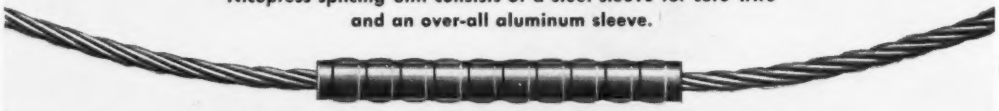
"Originators of the ⅝% Step Regulator!"

Nicopress SLEEVES for A·C·S·R·

WILL GIVE YOU PEAK PERFORMANCE!

COMPLETED LINE SPLICE

Nicopress splicing unit consists of a steel sleeve for core wire and an over-all aluminum sleeve.



COMPLETED JUMPER SPLICE

REPAIR SLEEVE
(Partially Completed)

Nicopress is the Registered Trade Mark of The National Telephone Supply Company

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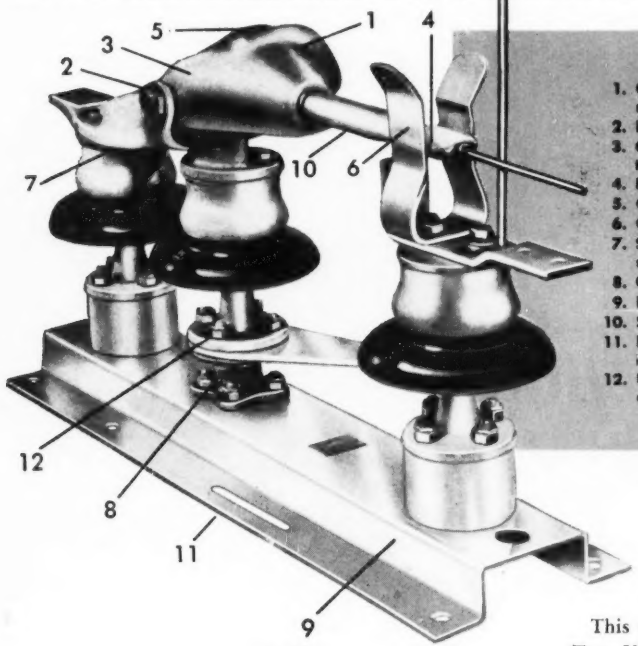
THE NATIONAL TELEPHONE SUPPLY COMPANY

YOU CAN BE **SURE**.. IF IT'S
Westinghouse



1. Completely-enclosed hinge-end mechanism.
2. Live-side bearings, lubricated for life.
3. Completely-enclosed solid bridging contact at hinge end.
4. High-pressure line contacts.
5. Only three moving parts.
6. One-piece break jaw.
7. Simplified and enclosed counterbalancing spring.
8. Greaseless, rotating insulator bearing
9. High-strength, bent-plate steel base.
10. Single tube blade.
11. Flat mounting surface with no downward extensions.
12. Universal operating mechanism for group operation.

LOOK CLOSELY!

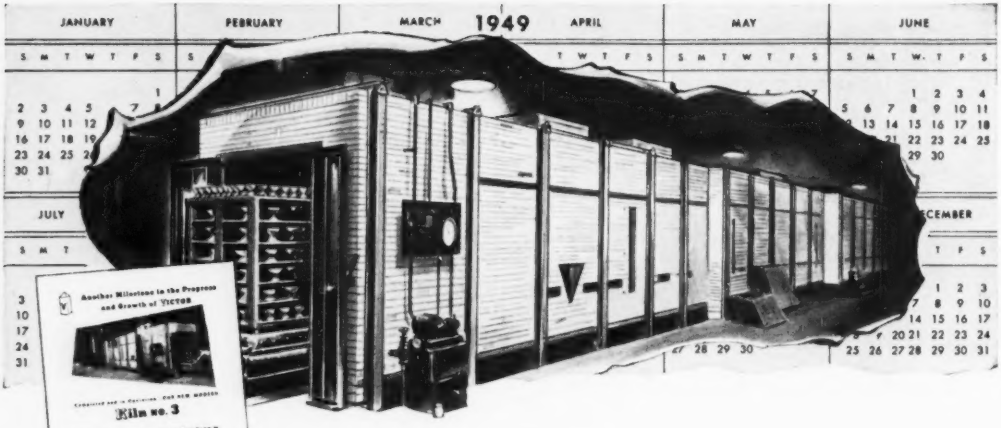
Do your disconnecting switches have these features?

Check the above features closely. Each one *alone* means a better switch for your money. Install the Westinghouse Type V and you get them *all*.

This combination of vital features makes the Type V the leader of the switch field in dependability, economy and low maintenance. Get the benefits of experience and top-grade switch design in *your* system. Install the Westinghouse Type V.

For complete information on the Type V, or on the entire Westinghouse switch family, get in touch with your nearby Westinghouse office or distributor. Ask for B-4241 and B-4242. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-60699

TYPE V
DISCONNECTING SWITCHES



In 1948 we announced the completion of our new Tunnel Kiln No. 3

NOW...ONLY 1 YEAR LATER

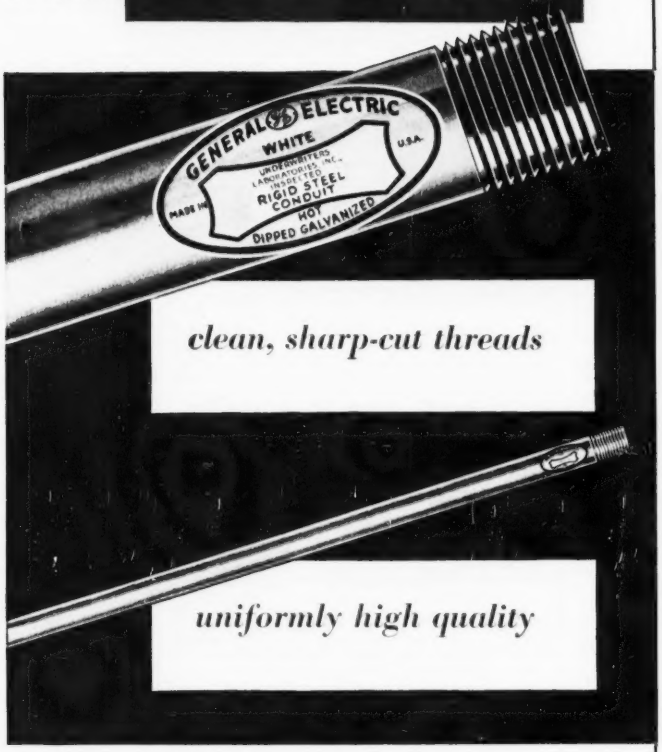
VICTOR'S KILN No. 4

IN FULL OPERATION

Proof that Victor, America's fast-growing insulator company, is geared to handle *your* demands for *Quality*, *Quantity* and *Dependable Deliveries* in high voltage insulators.

Leading power utilities and manufacturers insist on the famous wet-process porcelain insulators made by Victor because of their *unsurpassed performance.* These insulators are fired in the latest-design tunnel kilns with the most *modern* equipment—to assure dependability in mechanical and electrical properties. Victor ceramic engineers, electrical engineers and *skilled craftsmen* have the experience and know-how which combine to produce a product of uniform quality, uniform dimensions, uniform appearance! With our battery of modern kilns, we are better equipped than ever to serve your needs. We are at your immediate service for consultation on standard or special porcelain requirements.

You know you're right with "G-E White"



Clean-cut threads and uniformly high quality are only two of several features that make General Electric white rigid conduit the first choice of electrical contractors and maintenance men everywhere. Other considerations are its *hot-dipped* zinc coating—fused into high-grade steel—and its tough, smooth-as-glass Glyptal* lacquer finish, inside and out.

Always, when you think of rigid conduit . . . think of "G-E White." For further information, see your nearest General Electric Construction Materials distributor, or write to Section C15-425, Construction Materials Department, General Electric Company, Bridgeport 2, Connecticut.

*Trade-mark Reg. U. S. Pat. Off.

GENERAL ELECTRIC

RACEWAYS ROUNDUP

with your

GENERAL ELECTRIC

Construction Materials Distributor

Still the favorite for wiring protection against chemical corrosion is General Electric black rigid conduit. "G-E Black" is made from the same high-grade steel—and is manufactured with the same precision—as "G-E White." The tough, glassy-smooth, baked-on enamel makes wire pulling easy, and is an excellent paint base.

General Electric switch and outlet boxes are made in a variety of sizes, shapes, and depths for every purpose. Most are available either galvanized or with black-enamel finish. All cable and conduit boxes have improved knockouts, are easy to install, and have the approval of Underwriters' Laboratories, Inc.

General Electric fittings and accessories for the complete line of G-E conduit products are available. Carefully designed connectors, nipples, couplings, and other fittings make installation of G-E raceways simple and fast. All types of connectors for armored and nonmetallic cables are included in the G-E line. When installing any type of electric wiring, make sure you use General Electric fittings.

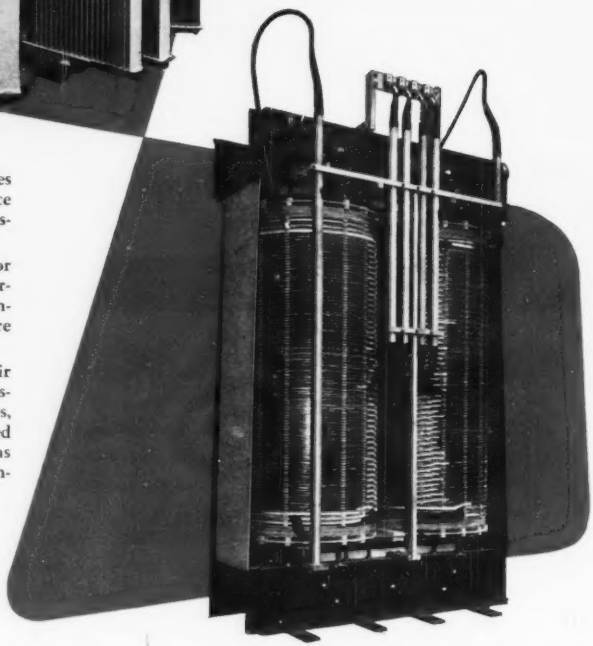
On your next order, why not try the time-saving, "one-stop, one package" service that your General Electric distributor can supply? Because he carries the complete General Electric line, you can order every item you need from him. No need to run around getting part of your requirements in one place and part in another. It's the kind of service busy contractors need to help stretch scarce working hours.

Conduit Products

Wagner Transformers on the job . . .

16,667 kva power transformer

Single Phase, 60 Cycle
72,000 to 6,600 volts

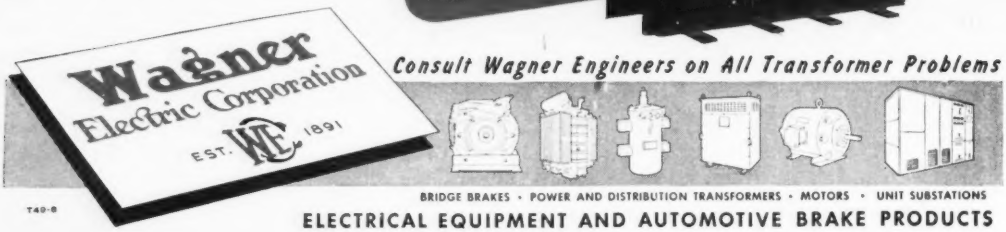


Wagner, with a background of almost six decades of transformer manufacturing, has the experience and facilities to make the building of power transformers part of the day's work.

Wagner Power Transformers are known for their *proven* dependability because they are liberally designed with extra factors of safety, constructed of carefully selected materials, and are expertly engineered, built, and tested.

Users of power transformers will find it to their interest to consult Wagner on their next transformer installation. Twenty-nine branch offices, located in principal cities and manned by trained field engineers, are ready to serve you. Bulletins TU-180 and TU-181 give information on the complete line of Wagner Transformers.

Wagner Electric Corporation
6381 PLYMOUTH AVE., ST. LOUIS 14, MO., U. S. A.

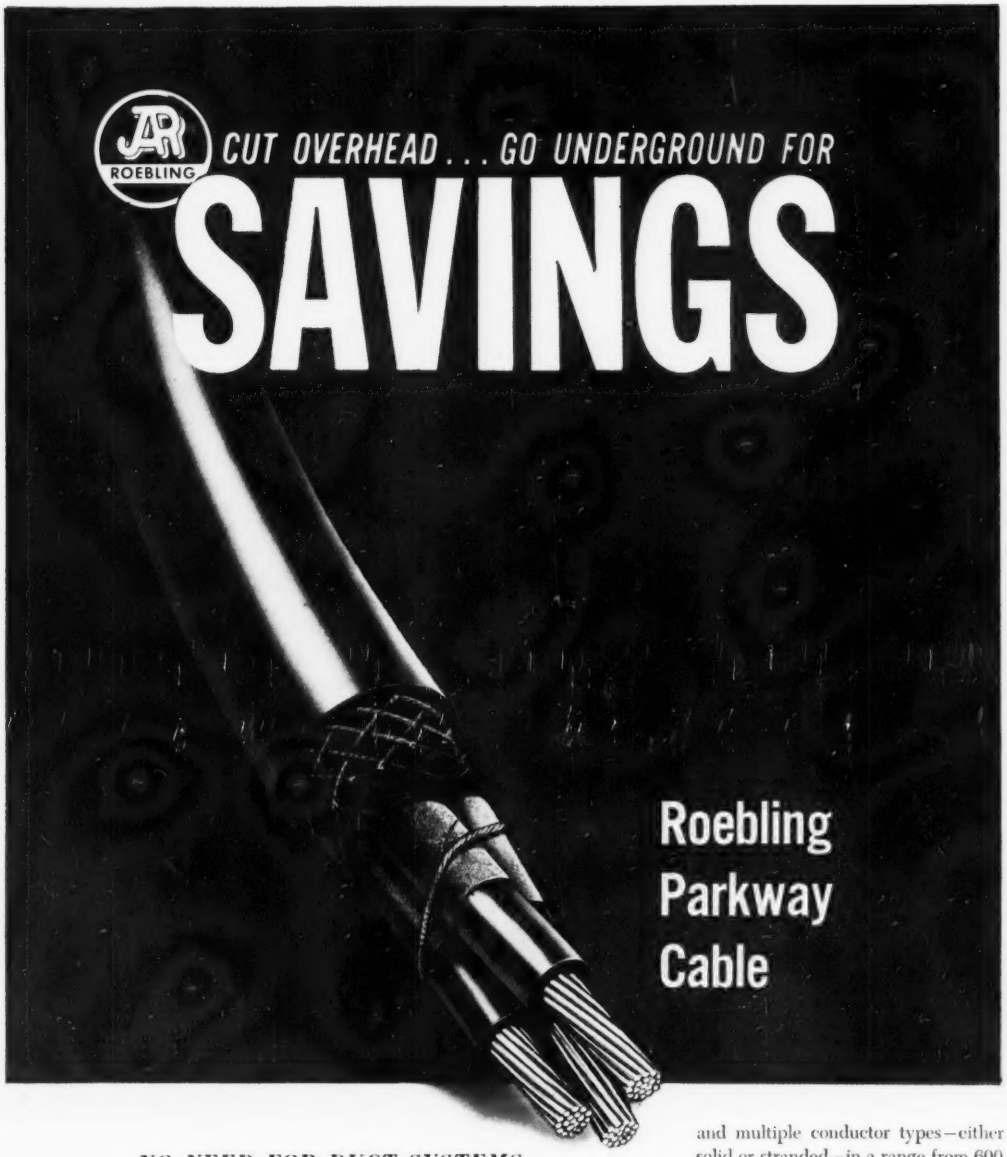


Consult Wagner Engineers on All Transformer Problems

BRIDGE BRAKES • POWER AND DISTRIBUTION TRANSFORMERS • MOTORS • UNIT SUBSTATIONS

ELECTRICAL EQUIPMENT AND AUTOMOTIVE BRAKE PRODUCTS

T49-B



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ROEBLING PARKWAY CABLE is laid directly in the ground. No complicated and costly duct systems . . . a trench only two or three feet deep is ample and economical. Once installed, you can count on Roebling Parkway for trouble-free and uninterrupted service.

You have the choice of Roebling Parkway Cable with metallic armor or with a non-metallic, roeprene sheath that affords dependable physical protection. Both can be supplied in single and multiple conductor types—either solid or stranded—in a range from 600 to 5000 volts.

Your nearest Roebling distributor or Roebling office will help you select the best cable for your requirements. Call on them for any assistance. John A. Roebling's Sons Co. of Calif., 1740 17th St., San Francisco, Calif.

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ROEBLING

☆ *A CENTURY OF CONFIDENCE* ☆

76 YEARS MANUFACTURING EXPERIENCE back every THOMAS Insulator

Seventy-five years ago, The Thomas Company started ceramic manufacture. During this three-quarters of a century, Thomas has pioneered many firsts in the insulator field.

Consider Suspension-Strain Insulators as an example. The Thomas Company built the *first* commercial Cap-and-Pin Suspension Insulator back in 1907. Since then, we have constantly refined the design and improved its quality. The result is the Thomas Suspension-Strain Insulator you see here . . . the only insulator with such an enviable and unsurpassed "pedigree".

Despite these unusual times, when quality and skilled workmanship could be sacrificed, you can specify Thomas Insulators with full confidence that quality and value cannot be surpassed.

All Thomas Insulators have been constantly improved . . . quality workmanship is still the watchword of all production. Each insulator has the plus values to meet every type of line condition. Standard designs may be selected for your toughest assignments.

EARLY THOMAS DEVELOPMENTS

First High-Voltage, Multi-Part, Pin-Type Insulator. First Cap-and-Pin, Suspension-Strain Insulator.

Many of these are still in operation. They are the best proof of the long life and stamina of Thomas Porcelain.

1873 THOMAS INSULATORS our 76th year RELIABILITY 1949

YOUR LETTERHEAD BRINGS THIS FREE CATALOG

. . . which illustrates and describes the complete Thomas Line. Enclosed in a loose-leaf binder, it provides a ready reference for all Transmission-Distribution Insulators and Associated Line Hardware. New Insertions, as issued, are sent to all catalog holders.

The R. Thomas and Sons Co.

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Use SECURITY

For a Grip that STICKS

Pick Security Friction Tape

This strong, rubbery tape has high insulating properties and the tensile strength that's needed for the tougher jobs. Security has no pinholes—doesn't unravel when unwound from the roll. There isn't a better all-around electrical and general-purpose tape on the market. Safe, sure, long-lasting, Security is your handy man for any splicing job. Write to United States Rubber Company, 1230 Avenue of the Americas, New York 20, N. Y.

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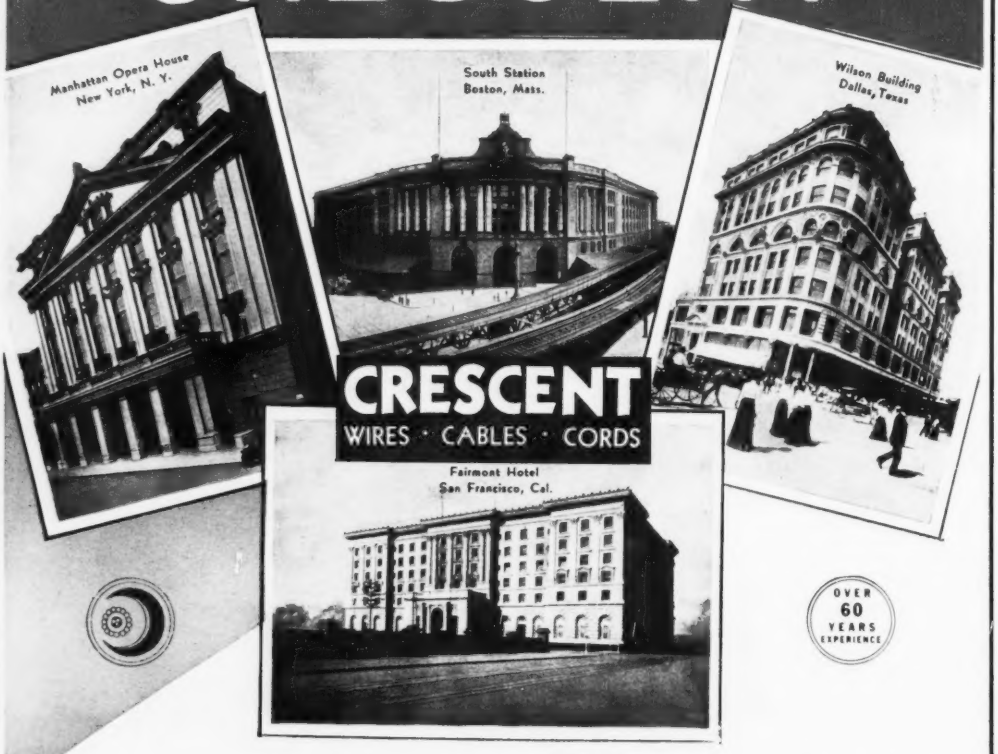

Use CRESCENT Wire & Cable for longest trouble-free service

The existing buildings shown above as they appeared in our catalog printed over forty years ago, were wired with CRESCENT, which has given dependable service through the years.

From coast to coast for over sixty years CRESCENT Wire has been a first choice of architects, engineers and electrical contractors for outstanding building jobs.

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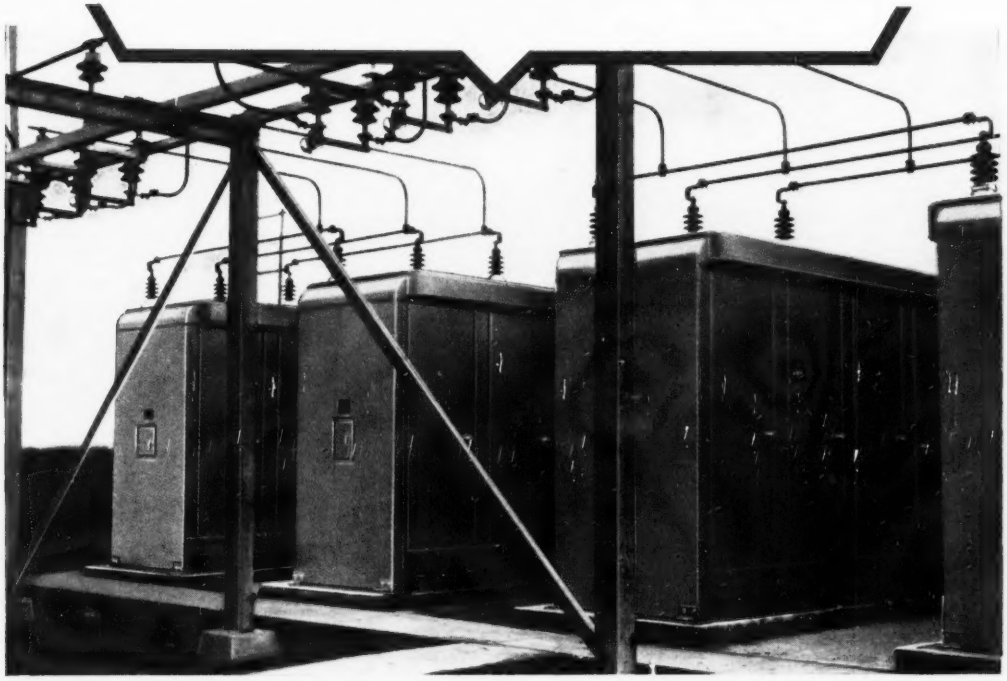
New Capacitor Equipments

using 25-kvar capacitors

Cut Installed Cost



This is one of the largest installations of capacitor equipments made to date. It consists of General Electric 5100-kvar equipments of the newest design, employing 25-kvar Pyranol* capacitors with glass bushings.

General Electric has recently introduced a new line of power capacitor equipments using 25-kvar capacitors. Price of the equipment, including capacitors, is materially lower per kvar than those previously available. The housing is about 30% smaller, cutting foundation costs and saving space. And the number of individual capacitors is reduced 10%.

MANY IMPROVEMENTS TOO

Besides their lower installed cost and smaller size, these new equipments bring you several improvements that will interest operating personnel: The roof terminal bushings are arranged so as to simplify bus work, particularly where banks are used. Improved interlocking of doors with line breakers and grounding switches precludes possibility of reaching charged capacitors. Thermostatically-controlled fans provide air circulation within the housing when needed.

For information on these equipments, call your G-E sales office. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

*Reg. U.S. Pat. Off.

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With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western Cities.

He's a chip off the old block, all right...the same "radiant glow" appearance and fine **precision-planned** lighting performance that's already made the original **Guthlite*** so successful. In fact, "JR." is the livin' image of his daddy except that he sports a "junior" price tag and has no "Jacknife" Hinge.

Instead, you merely release two little hooks on **either** side and the louver assembly swings down for easy relamping and cleaning.

Guthlite* JR. comes in both 2-40W and 2-85W sizes. For complete details, request our new Pocket Catalog 46A-C. Where you need a **proved** performer at a popular price, you can really cash in on this husky, handsome youngster ...take it from

YOUR TEAMMATE
IN *precision-planned* LIGHTING

Guth LIGHTING

THE EDWIN F. GUTH COMPANY / ST. LOUIS 3, MISSOURI

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ELECTRICAL BOOKS

MICROWAVE ANTENNA THEORY AND DESIGN, MIT Radiation Laboratory Series No. 12, edited by Samuel Silver, 623 pages, 6x9, McGraw-Hill Book Co., $8. Provides a comprehensive survey of theory and design techniques for microwave antennas and a full discussion of antenna measurement methods. A survey of those parts of electromagnetic and optical theory which are basic to the subject is followed by a series of chapters discussing various types of antenna feeds and the complete antenna systems used for producing all principal types of microwave beams. Aberrations and special features of microwave optical systems are discussed in relation to rapid scan antennas.

★

VACUUM TUBE AMPLIFIERS, MIT Radiation Laboratory Series No. 18, edited by George E. Valley Jr., and Henry Wallman, 743 pages, 6x9, McGraw-Hill Book Co., $10. Seeks to analyze completely, to give design principles of, and to describe the special constructional techniques pertaining to many important types of amplifiers. Amplifiers selected for treatment are characterized either by very high gain, by large band width, by great dynamic range, or by precise response. Video amplifiers, wide-band high-frequency band-pass amplifiers, low-frequency band-pass amplifiers, and direct-coupled amplifiers are discussed. Noise in amplifiers is treated, and the practical design of minimal noise amplifiers described.

★

WAVEFORMS, MIT Radiation Laboratory Series No. 19, edited by Britton Chance, Frederick C. Williams, Vernon Hughes, Edward F. MacNichol and David Sayre, 785 pages, 6x9, McGraw-Hill Book Co., $10. Describes generation and use of precisely controlled voltages and currents having various time dependence and duration. Discusses new methods of wave shaping by linear circuit elements and negative feedback amplifiers. Properties of vacuum tubes as nonlinear circuit elements and their applications to waveform manipulations are presented in detail. Operation of various types of multivibrators, blocking oscillators, and other basic circuits, is discussed. Waveforms of precisely adjustable duration are emphasized. Use of linear and nonlinear circuit elements in modulation, demodulation, frequency multiplication and division, and in rapidly executed mathematical operations, are treated.

★

RADAR SCANNERS AND RADOMES, MIT Radiation Laboratory Series No. 26, edited by W. M. Cady, M. B. Karelitz and L. A. Turner, 491 pages, 6x9, McGraw-Hill Book Co., $7. Takes up problems of mechanical and electrical engineering and of servo design which underlie the design of scanners for practical radar sets. Land-based, shipborne, and air-borne scanners are treated. Gyroscopically controlled antenna stabilization is discussed. Treats of the practical mechanical, electrical, and aerodynamic problems of design of radomes (housings for scanners). Includes discussion of properties of the most useful materials, and some development of the theory of the effects of such housings on the radiated waves.

DAY-MAKING MAGIC AT NIGHT!

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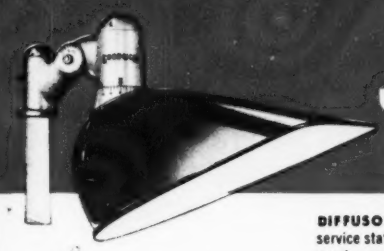
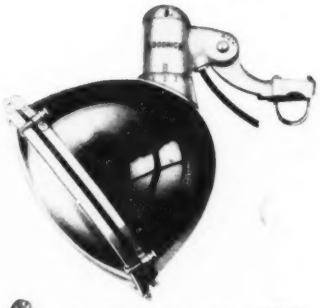
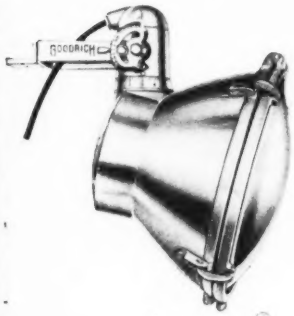
"GOODRICH" FLOODLIGHTS



DIFFUSO—For even illumination of service stations, athletic fields, tennis courts, parking spaces, etc. Available for pole, bracket or crossarm mounting.





SPORTO—Supplied with or without glass cover. Weather-proof hood permits complete vertical and lateral positioning. Pole, bracket or crossarm mounting.

LUMO—Made from aluminum, Alzac Electro-chemically processed. With or without heat-resisting glass lens; narrow or medium beam spread. Pole, bracket or crossarm mounting.

Nighttime events are bathed in noontime brilliance under Appleton "Goodrich" Floodlights. Available in a wide variety of types and styles, these expertly engineered floodlights are designed to provide the utmost in after-dark vision.

The permanent porcelain enamel finish on Appleton Floodlights makes them ruggedly resistant to the most severe atmospheric conditions. They are furnished with hoods for bracket, pole or crossarm mounting. When specified, most models may be equipped with a water and dust-tight glass lens. All types may be cleaned quickly, easily—without removing wiring.

The Appleton Line of Lighting Equipment includes a type and size light to cover virtually every requirement, whether indoors or out. Each light is a model of mechanical simplicity—easily installed, easily wired, easily serviced. For the lighting equipment you need, specify Appleton.

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Certified Starters are made to precise specifications, then are tested and certified by Electrical Testing Laboratories, Inc., an impartial authority. That's why you can always rely on Certified Starters.

● *You'll recognize Certified Starters by the Certified shield on the case and on each starter.*

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Smithcraft Troffers

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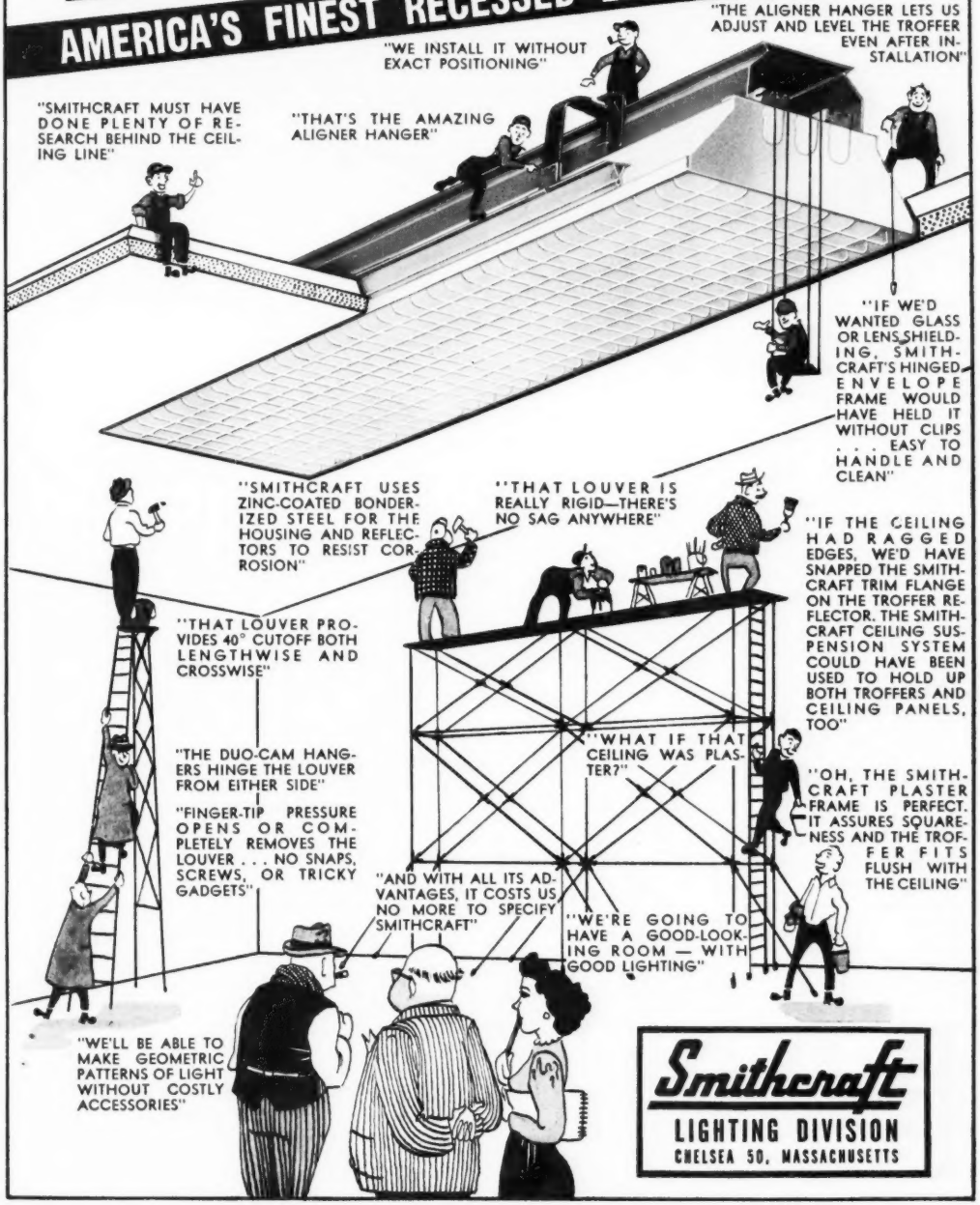
"SMITHCRAFT MUST HAVE DONE PLENTY OF RESEARCH BEHIND THE CEILING LINE"
"THAT'S THE AMAZING ALIGNER HANGER"
"WE INSTALL IT WITHOUT EXACT POSITIONING"
"THE ALIGNER HANGER LETS US ADJUST AND LEVEL THE TROFFER EVEN AFTER INSTALLATION"
"IF WE'D WANTED GLASS OR LENS SHIELDING, SMITHCRAFT'S HINGED ENVELOPE FRAME WOULD HAVE HELD IT WITHOUT CLIPS . . . EASY TO HANDLE AND CLEAN"
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"THAT LOUVER PROVIDES 40° CUTOFF BOTH LENGTHWISE AND CROSSWISE"
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"OH, THE SMITHCRAFT PLASTER FRAME IS PERFECT. IT ASSURES SQUARENESS AND THE TROFFER FITS FLUSH WITH THE CEILING"
"AND WITH ALL ITS ADVANTAGES, IT COSTS US NO MORE TO SPECIFY SMITHCRAFT"
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"Nancy" and the Professor go in for air travel while he points out how lighting works for everyone.

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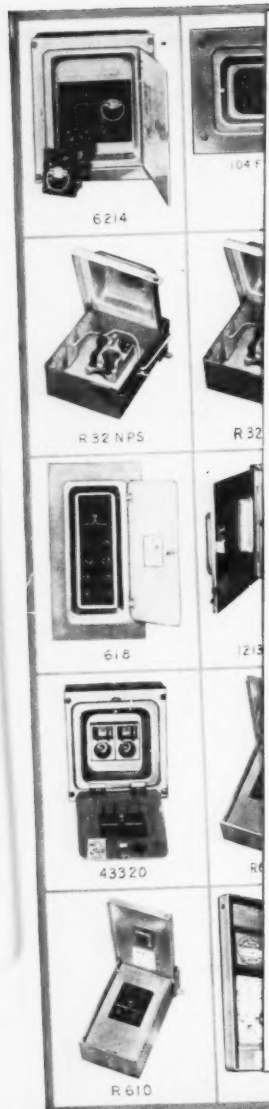

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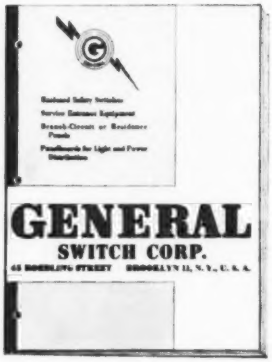

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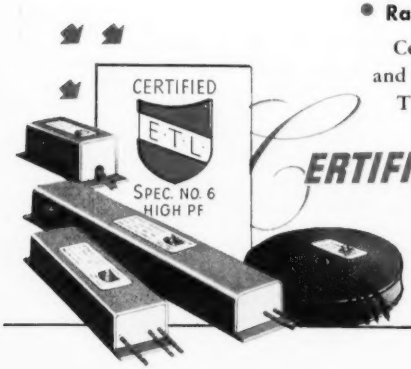

Certified Ballasts are made to rigid specifications—then tested and checked by impartial Electrical Testing Laboratories, Inc. That's why I have confidence in Certified Ballasts. You will, too.

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Makers of Certified Ballasts for Fluorescent Lighting

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How you can use the

FLEUR·O·LIER INDEX SYSTEM*

Whether you make, sell, specify or buy fluorescent lighting equipment, The Fleur-O-Lier Index System will make your job easier. For the Index System provides a simple, usable method for rating and classifying fluorescent fixtures on the basis of their illuminating performance.

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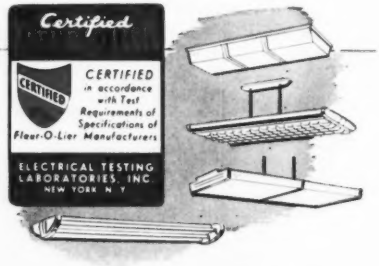
Fleur-O-Lier fixtures are carefully examined by Electrical Testing Laboratories, Inc., and assigned a rating under the Index System. All the buyer need do is select fixtures that meet the specifier's Index System number. Then with the photometric test data and the coefficients of utilization provided with all Fleur-O-Lier fixtures, he has complete information to make an intelligent purchase of fixtures that meet the specifications and perform efficiently.

**To get complete information on this easy way to specify and buy fixtures, write for free booklet, "The Fleur-O-Lier Index System".*

This label is attached to every FLEUR-O-LIER luminaire. It certifies that a similar fixture has been examined by Electrical Testing Laboratories, Inc., and found to conform to specifications. This label is your assurance of excellence in mechanical and electrical construction and in performance. It means that Certified Ballasts and Starters are used and that the requirements of the National Electrical Code have been met.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Manufacturers

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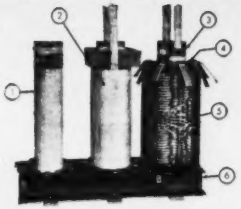
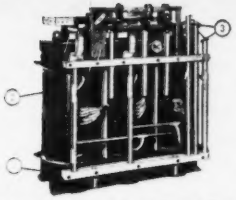
GUARD AGAINST Power Outages

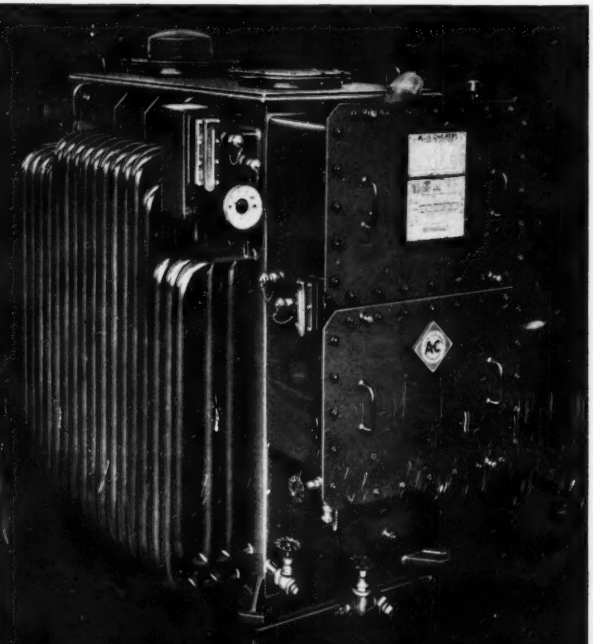
with Allis-Chalmers Network Transformers



THREE STAGES of core and coil assembly: (1) Core stack of non-aging silicon steel (2) Low voltage coil on insulated core (3) Extra insulation at vital points (4) Ducts provide liberal cooling area (5) All connections brazed (6) Support blocks form entrance to cooling ducts.



ASSEMBLED core and coil: (1) Broad flanges support coils (2) Disc type high voltage coils wound with uniform tension (3) Leads supported in machine wound tubing. Assembly is thoroughly dried and tightened before tanking. Ample clearances are maintained between live parts and ground



Designed to withstand adverse operating conditions, Allis-Chalmers Network Transformers mean *dependable metropolitan power!* Vault type transformer above shows the compactness attained with the lower, welded-on high voltage switch compartment.

WHERE HIGHLY concentrated loads are being served, power companies can't afford to gamble with circuit interruptions. That's why thermal capacity and resistance to short circuit stresses are such important factors in the selection of Network Transformers.

Details of construction (above) show how Allis-Chalmers Network Transformers are *specially designed* and built to beat power outages. These features of electrical and mechanical construction have been proved by nearly 1,000,000 KVA of installed capacity.

Practically any Network system need can be met by selecting from A-C's wide range of *standard* types and ratings. In other cases, modifications of standard units will be made to suit *any special system requirements.*

Ask your nearby sales representative for additional information about these dependable transformers—for example, about the many significant features of tank construction. Or write for bulletin 61B6152A. A 2602

ALLIS-CHALMERS, 939A SO. 70 ST. MILWAUKEE, WIS.

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Network Transformers—Nearly 1,000,000 KVA Installed

I CUT THE WASTE in Materials and Labor EVERY TIME I USE National Electric FLEXSTEEL FLEXIBLE LIGHT-WALL CONDUIT

Cuts installation time *more than* 50% under rigid conduit... Reduces conduit footage . . . Virtually eliminates the waste in materials and labor.

- ✓ No bending tools needed
- ✓ No exacting measurements required
- ✓ No coupling or jointing
- ✓ No short pieces or waste
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- ✓ Easy to fit—outlet to outlet
- ✓ Easy to cut on the job
- ✓ Easy to fish

You'll like the *convenience* and *economy* of NE FLEXSTEEL flexible conduit. Listed by Underwriters' Laboratories, Inc. FLEXSTEEL is an approved pull-in and pull-out system.

A FULLY GROUNDED STEEL CONDUIT SYSTEM AT MINIMUM COST

This rounded channel-iron shape adds strength Makes fishing easy over the roller-bearing surface. The spring action of the cold-rolled steel holds a true circular cross section under any bend.

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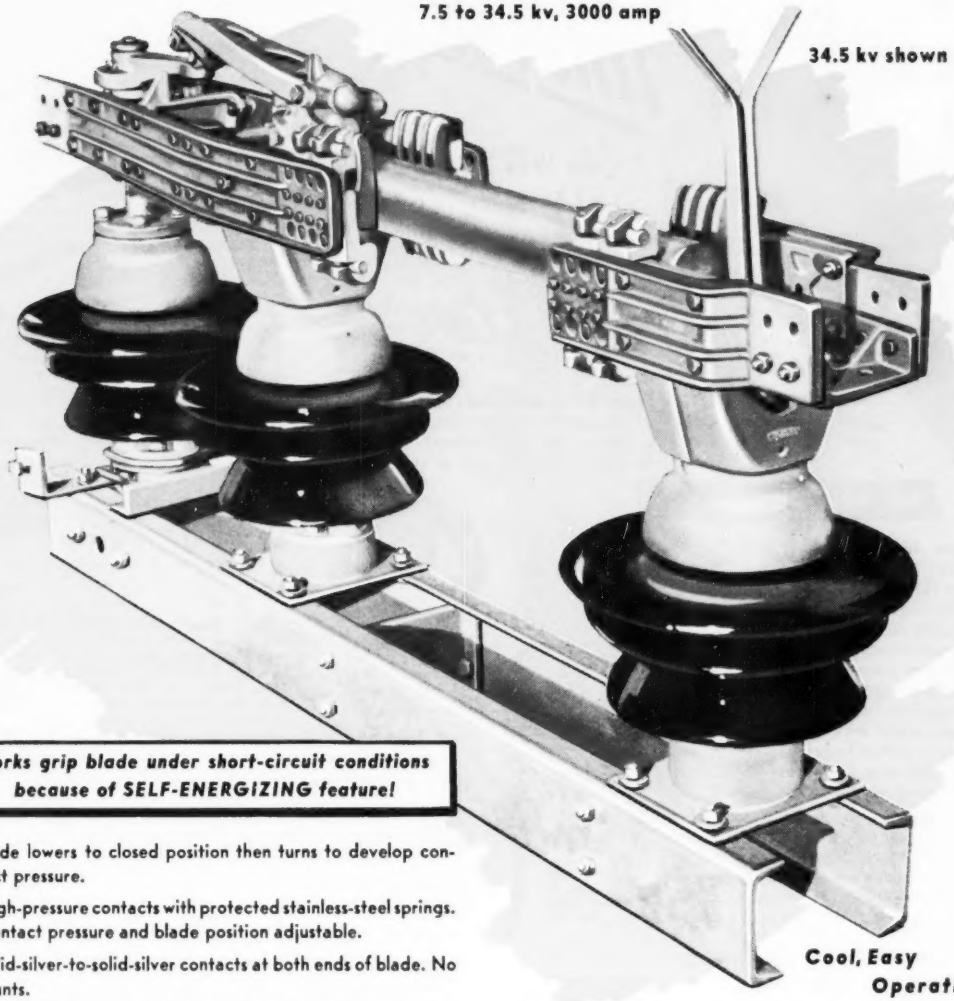
for Extra-Large Capacity

Type TW-30

7.5 to 34.5 kv, 3000 amp



34.5 kv shown

Forks grip blade under short-circuit conditions because of SELF-ENERGIZING feature!

- Blade lowers to closed position then turns to develop contact pressure.
- High-pressure contacts with protected stainless-steel springs. Contact pressure and blade position adjustable.
- Solid-silver-to-solid-silver contacts at both ends of blade. No shunts.
- Contact deflection is relatively large yet pressure varies only 5% over entire range of deflection. No critical adjustments. Pressure not affected by wear.
- Current-carrying parts all copper alloy or silver.

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- All bearings are anti-friction type including bearings in operating mechanism. No lost motion in switch or mechanism.
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the NEW IDEAL

Stripmaster

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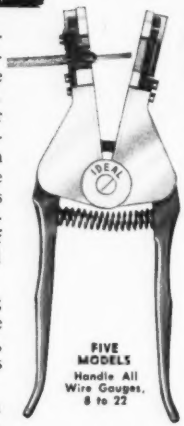
New in design—new in performance! The precision-built, pocket-size IDEAL Stripmaster makes wire stripping easier than ever before. There's no other hand-type stripper even remotely like it! . . . *One* light-pressure squeeze strips wire clean and bare up to 7/8 inch. Exclusive "automatic" feature that holds jaws open while wire is removed positively eliminates crushing of stranded wire. No waste—no nicked or frayed wire—no cut fingers.

Just squeeze the handles to strip; release your grip and remove the wire. The jaws then *snap* back, ready for the next strip. Takes less than 3 seconds.

So light (10 oz.) and compact even a girl can use it all day long without fatigue — so strong and simple as to be practically abuse-proof. Blade is hardened and ground for extra-long life—when necessary can be changed in a jiffy.

Other IDEAL Electrical Tools and Products Include:

"WIRE-NUTS" — the patented solderless, tapeless wire connectors . . . FISH TAPE, REEL AND PULLER, B-X ARMOR CUTTER, VOLTAGE TESTER and many others.



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Handle All Wire Gauges, 8 to 22

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(Use the Stripmaster right on the assembly line)

STRIPS ANY OF THESE TYPES OF WIRE
Building Wire
Fixture Wire
Telephone Wire
Lamp and Appliance Cords (individual conductors)
Automotive Wiring
Radio and Instrument Wire and Cable
Switchboard Wire
Aviation Wire
FM and TV Down Lead Wire

Just Insert Wire, Squeeze and Release!

(1) Insert wire between jaws and hold in proper stripping hole; (2) Squeeze handle to cut insulation and strip; (3) Release handle and remove the wire. Jaws immediately snap back into position.

IDEAL

Distributed Through America's Leading Wholesalers

IDEAL INDUSTRIES Inc., Sycamore, Illinois

PRODUCT NEWS

Service Entrance Cable (400)

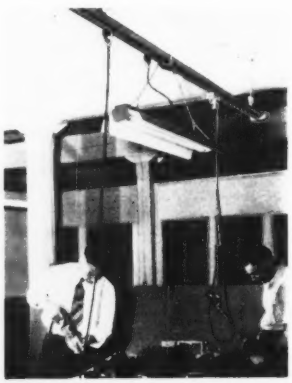
U. S. Rubber Co. has developed a service entrance cable with natural rubber insulation and an outside jacket of neoprene, which it claims will wear four to five times longer than conventional braided types. According to the manufacturer, the neoprene jacket will eliminate festooning, is fire retardant and gives the cable high resistance to rain, ice and sleet, deterioration by sunlight. The cable is approximately 1/4-in. smaller in over-all diameter than braided types but weighs the same. The cable comes in three No. 6 conductors, two No. 6 conductors and one No. 8 conductor, three No. 8 conductors. It is approved by Underwriters' Laboratories as type "SE."

Shipboard Wires, Cables (401)

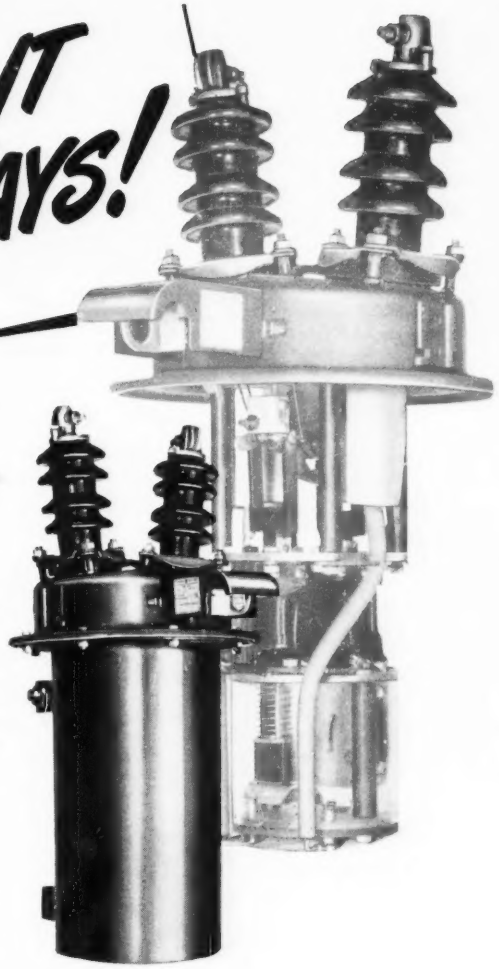
A complete line of AVC heat- and flame-resisting electrical wires and cables for shipboard use is offered by Rockbestos Products Corp. Their insulation, impregnated felted asbestos and varnished cambric, is protected by a new impervious sheath and basket-weave metallic armor, the announcement states.

Trolley Busway (402)

Trumbull is making an LTG Flex-A-Power plug-in or trolley busway designed to provide both trolley power take-off and a continuous outlet for fluorescent lights and small power tools. The manufacturer states that new simplified hanging and joining methods speed up installation 30%. It is rated 50 amp., 250 volts, a-c or d-c; has two or more circuits that can be run in one housing and be controlled separately, a space-saving feature. Plugs or trolleys are polarized so that loads may be balanced conveniently on both sides of the busway. it is stated. LTG is built in standard fittings such as elbows and radius sections for custom-engineered installations.



COMPARE IT THREE WAYS!



The FR-1 Relayed Automatic Recloser

1 FOR MINIMIZING OUTAGES

Fuses and conductors are protected by instantaneous first and second operations—very fast openings—regardless of ambient temperature, viscosity or condition of oil.

- False operations are prevented by precision timing—plus relay control of the interrupter—and, again irrespective of temperature or oil.
- Re-setting is 5- to 15-times faster than other types of reclosers—protecting against rapidly recurring temporary faults, even successive line flashovers by lightning strokes seconds apart.
- Inrush current cannot instantaneously retrip recloser.
- Fewer outages on every score.

2 FOR ECONOMIES IN MAINTAINING SERVICE

Fewer outages mean, of course, fewer service trips. Moreover the unavoidable outages can be located more quickly and service restored in less time.

- With the FR-1, many series fuses can be used to further sectionalize the system with permanent faults always confined to a minimum number of consumers. As many as 4 to 7 different ratings of fuses can be reliably co-ordinated with each rating of recloser because of the established minimum and maximum characteristics of the recloser and year-round accuracy.

3 FOR ENDURANCE IN SERVICE

Oil Blast interruption of arc in ½ cycle means longer life—minimum wear of arc-resisting Elkonite contacts and minimum carbonization of oil.

- Gears of heavy-duty escapement timer are case-hardened and plated. Timer operates in air above the oil, for lasting fidelity of timing and independence from temperature changes or viscosity of oil.
- Coils will withstand continuous current up to two times rating (up to minimum pickup current) without damage—unexpected overloads can't hurt the coils.
- Built-in Thyrite valve element by-passes lightning and surge voltages—protects turn insulation of coils.

Bulletin GEA-4934 describes in detail this unique recloser, gives data on co-ordination with fuse links and tells about its "locked-closed" alternate operating function (convertible in the field) which simplifies and extends co-ordination with fuses. For your copy address your G-E Apparatus Sales Office or write *Apparatus Dept., General Electric Company, Schenectady 5, New York.*

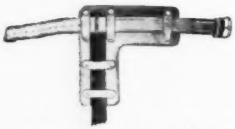
GENERAL ELECTRIC

416-24

660 Distributors ready to supply you in a hurry!

Buckingham
LINEMAN'S SAFETY EQUIPMENT

"Prompt Service" — two words that mean what they say when you deal with a Buckingham distributor. Fully stocked and strategically located, he's usually in a position to rush your order through. And when you buy Buckingham, you buy the best. Fifty years' experience in quality production assures you safe, dependable, low-cost linemen's equipment.



Deluxe Climber Pad provides utmost in comfort. Made of high-grade leather, padded with rubberized wool and backed with chrome leather. Five other designs to choose from—fitted with pads of rubberized wool or felt, or without padding.

Patented Right and Left Climbers. Offset in shank bring gaff in alignment with wearer's balance when climbing — greatly overcomes tendency of climbers to twist and slide back on legs. Range of lengths from 14" to 19"; weights: medium, light, feather. Other styles available: Straight Pattern Climbers; Adjustable Climbers; Tree Climbers.

Buckingham Thread Cleaner. Removes rust, smooths-out flats, and reconditions threads of mutilated studs and bolts. Adjustable jaws follow the pitch of right- and left-hand threads with root diameters from ¼" to 2 9/16". Two sizes: ¼" to 1" root diam.; 1" to 2 9/16" root diam.

OTHER BUCKINGHAM EQUIPMENT
- Adjustable Climbers
- Tool Belts
- Bags and Pouches
- Safety Straps
- Spur Protectors
- Skinning Knives
- Protecto Grips

WRITE for complete catalog and NEAREST distributor in your state

BUCKINGHAM MANUFACTURING CO., INC.
5-7 Travis Street Binghamton, N.Y.

Plug-in Strip (403)

National Electric Products is offering a new model Plug-In strip said to provide two distinct types of residential electric service. With the assembly mounted on baseboard or as chair-rail molding, home electrical equipment may be controlled at either wall or equipment.

Three No. 12 AWG copper conductors have been factory-wired into the strip. These conductors serve the 3-slot receptacles which are spaced at 18-in. intervals along the 24-gage steel assembly. Floor and table lamps and other equipment for control from wall switch are plugged into two of the three receptable slots. Equipment preferably controlled at the appliance is plugged into the center and lower slot for constant electrical service.

The new assembly has a permanently locked-on cover. When full 6-ft. lengths or parts of lengths are joined in an installation, a copper barrel connector is crimped over the conductor ends, to produce a mechanically massed copper connection. According to the announcement, the new model, like the single-service Plug-In strip, may be hacksaw cut to fit on the job without taking the assembly apart. It has a satin gray finish that may be painted to match baseboard, floor or wall. Underwriters' approved.

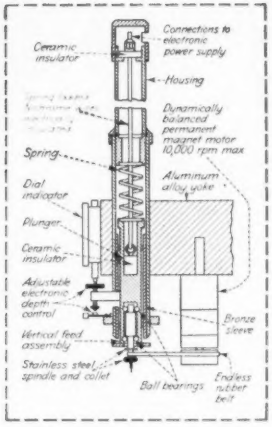
Meter Socket, Service Control (404)

For farm wiring, Heinemann Electric Co. is offering a combination weathertight tamper-proof meter socket and outdoor service control in one unit. Both enclosure and meter socket may be sealed by the power company and the cover over the circuit breaker may be padlocked by the user, according to the manufacturer. The enclosure contains one or two magnetic circuit breakers which, in case of short circuit, trip instantly before any damage can be done to equipment or transformer, but on harmless surges a magnetic-hydraulic time-delay unit prevents nuisance trips. Since no heat is generated in the enclosure, breakers carry 100% of rated capacity, the manufacturer states.

Test Switch Covers (405)

Meter Devices Co. has new plastic test switch covers. They are made of black Textolite, are fully insulated, molded in one piece. Front or back connected models are in production, four sizes for 4½-, 7½-, 9½- and 11½-in. switch bases available immediately, the announcement states.

a Revolutionary method of drilling microscopic holes that depends on NICHROME*



High coefficient of linear expansion of Nichrome V permits maximum vertical movement of spindle with shortest possible length of wire.

High tensile strength of Nichrome V permits use of a spring large enough to furnish sufficient force to drive spindle down.

High heat-resistance of Nichrome V permits heating wire to 1700°F. without permanent elongation—affording substantial drill feed range.

High specific resistance of Nichrome V minimizes heating current required.

Until now, precision drilling of extremely small diameter holes (such as .0016″ dia.) has been manually controlled. Even with highly skilled operators, however, drill breakage has been frequent—resulting in waste of time and effort, and damage to work and equipment.

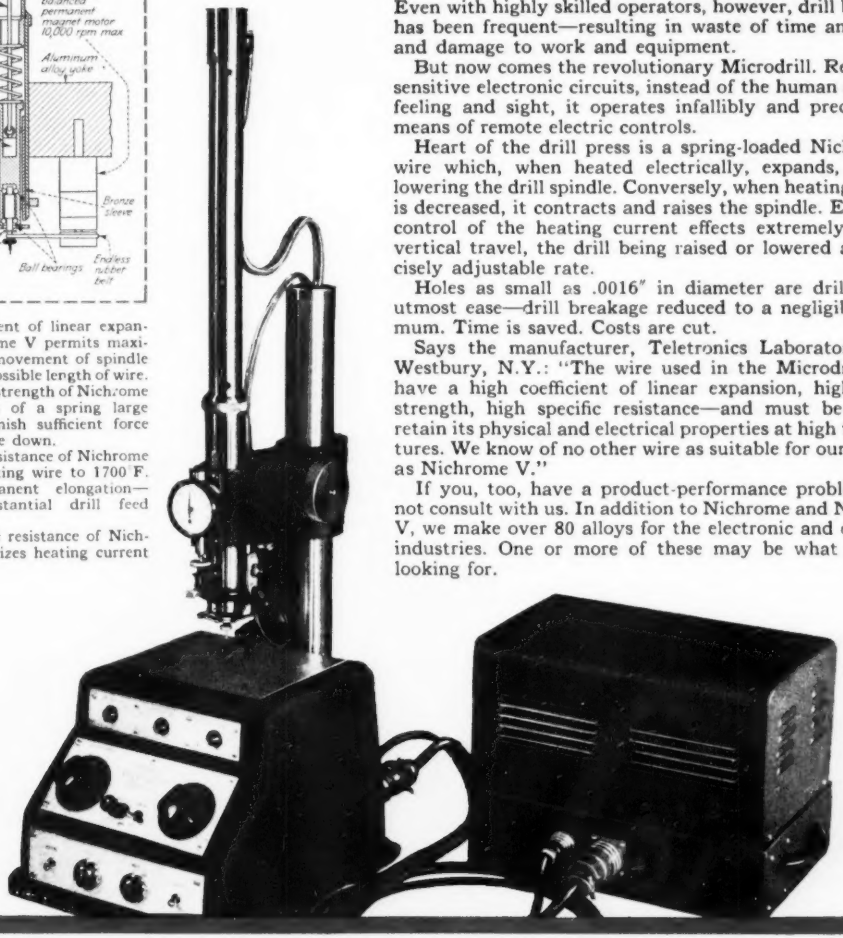
But now comes the revolutionary Microdrill. Relying on sensitive electronic circuits, instead of the human senses of feeling and sight, it operates infallibly and precisely by means of remote electric controls.

Heart of the drill press is a spring-loaded Nichrome V wire which, when heated electrically, expands, thereby lowering the drill spindle. Conversely, when heating current is decreased, it contracts and raises the spindle. Electronic control of the heating current effects extremely smooth vertical travel, the drill being raised or lowered at a precisely adjustable rate.

Holes as small as .0016″ in diameter are drilled with utmost ease—drill breakage reduced to a negligible minimum. Time is saved. Costs are cut.

Says the manufacturer, Teletronics Laboratory, Inc., Westbury, N.Y.: "The wire used in the Microdrill must have a high coefficient of linear expansion, high tensile strength, high specific resistance—and must be able to retain its physical and electrical properties at high temperatures. We know of no other wire as suitable for our purpose as Nichrome V."

If you, too, have a product-performance problem, why not consult with us. In addition to Nichrome and Nichrome V, we make over 80 alloys for the electronic and electrical industries. One or more of these may be what you are looking for.



50TH YEAR — SPECIAL PURPOSE ALLOYS SINCE 1899 — D/H — TRADE MARK REG. U. S. PAT. OFF. — 1899 • 1949

*Nichrome is manufactured only by

Driver-Harris Company

HARRISON, NEW JERSEY

BRANCHES: Chicago, Detroit, Cleveland, Los Angeles, San Francisco, Seattle
Manufactured and sold in Canada by
The B. GREENING WIRE COMPANY, LTD., Hamilton, Ontario, Canada

*T.M. Reg. U. S. Pat. Off.

6 Ways to Look

IMPORTANT DETAILS MAKE THE DIFFERENCE IN ALLIS-CHALMERS UNIT SUBS

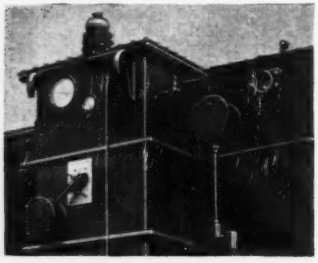
MANY DETAIL IMPROVEMENTS in unit substations have been pioneered by Allis-Chalmers: controlled gasket compression, protective *Oil-Sealed* inert gas system, "quick-break" contact separation, finger-type disconnects, no-corona taped bus joints, flexible drop collar throat, and others.

Together such improvements make up the real difference between superior and average performance. They are good points to look for, and compare, when purchasing unit substations for your distribution system.

±10% Regulation Results in Added Savings

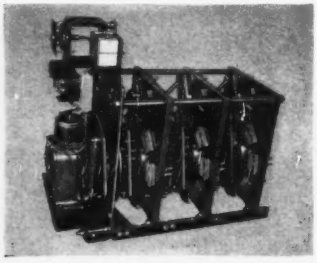
Allis-Chalmers unit substations cost less because of standardization on one range. This reduces your cost because the savings in engineering and manufacturing have been passed along to you. ±10% range was chosen since it fits most utility requirements and permits more load than ±7½%.

Call in your nearby A-C representative and have him go over the advantages you get with Allis-Chalmers unit substations. Or write direct.



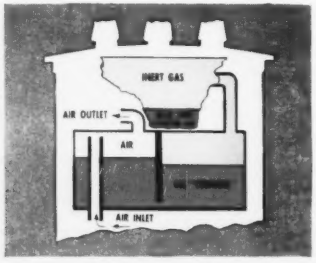
1. SAFETY

NO-LOAD TAP CHANGER on side of tank protects operator from accidental contact with overhead high voltage lines. Other safety features include: dead-front panels; interlocks; vertical lift breakers; drawout potential and control power transformers. Protects your operators, your equipment and your service.



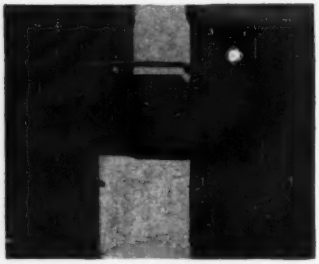
2. REGULATION

±10% RANGE is adequate for virtually any distribution substation. The narrow ⅝% steps of the tap-changing mechanism keep voltage fluctuations to a minimum. Oversize contacts and snap action minimize contact burning. Sturdy mechanism and motor operate in oil for maximum life.



3. MAINTENANCE

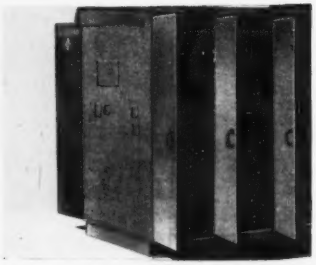
OIL-SEALED inert gas system uses no valves or external gas supply — reduces maintenance to routine gage readings. There are no external gas bottles to replenish, no waste gas. This system operates at pressures usually less than a pound . . . minimizing chance for gas leakage through gasketed joints.



4. INSTALLATION

DROP COLLAR throat saves time and money in preparing foundations. There is no need for exact alignment between transformer and switchgear because flexible connectors are used.

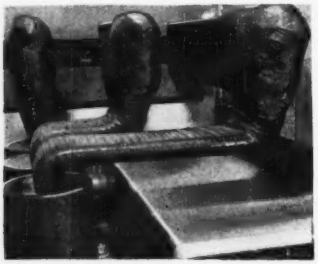
Switchgear units are shipped in groups as large as can be conveniently handled at the installation site.



5. ACCESSIBILITY

SWITCHGEAR HOUSING has doors front and rear permitting easy access to breakers; current, potential and control transformers; fuses.

Feather-Touch control for tap changer is in accessible cabinet. A transparent plastic cover for the voltage integrator permits inspection without breaking dust-tight seal.



6. FLEXIBILITY

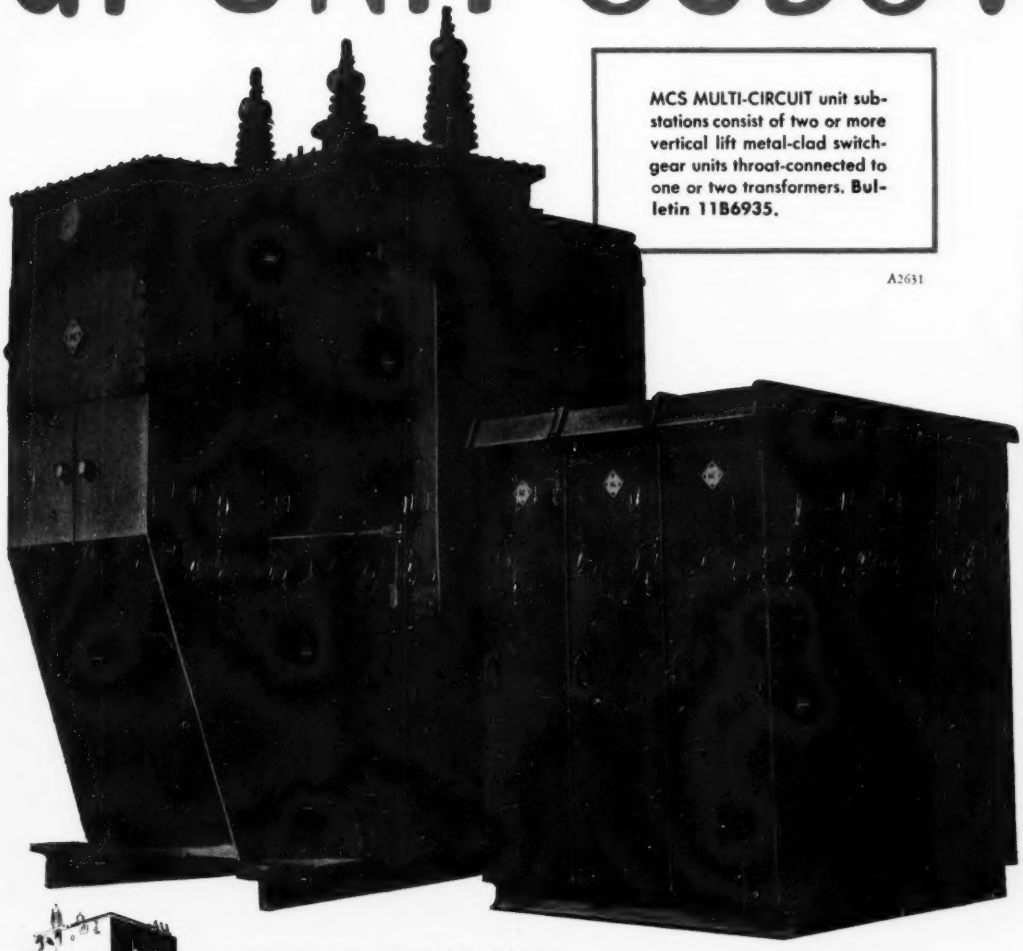
TAPED AND BOLTED connections reduce time and trouble involved in changing connections. No time is lost preparing compound in the field or filling connection boxes.

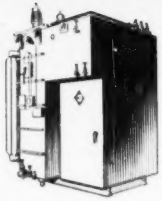
Standardized construction simplifies the addition of new switchgear units when more circuits are needed.

at UNIT SUBS!

MCS MULTI-CIRCUIT unit substations consist of two or more vertical lift metal-clad switchgear units throat-connected to one or two transformers. Bulletin 11B6935.

A2631





ALLIS-CHALMERS SCS SINGLE CIRCUIT unit substations consist of a transformer, secondary breaker and control, *Oil-Sealed* inert gas system for protecting oil, and the 32 5/8% step regulator mechanism for ±10% range of regulation — all combined within a single housing. They can be installed as a unit.

ALLIS-CHALMERS, 939A SO. 70 ST. MILWAUKEE, WIS.

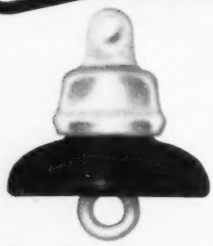
Feather-Touch and *Oil-Sealed* are Allis-Chalmers trademarks

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

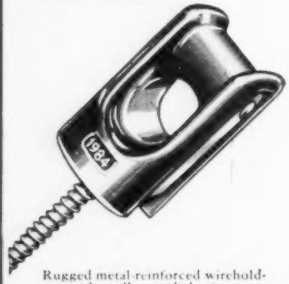
Pioneers in Load Ratio Control — Originators of 5/8% Step Regulation

...for all
HIGH VOLTAGE NEEDS
call
Porcelain Products



Rugged 6" Suspension Insulators—compression glazed for extra mechanical strength. Designed to withstand strain of wind and ice loads.

Pintypes that take a load off lineman's shoulders. Can be furnished with Type "N" radio interference eliminating glaze.

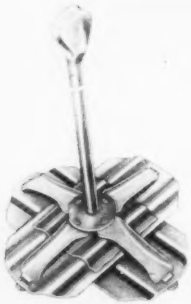


Rugged metal-reinforced wireholders with well rounded wire ways, heavy galvanized steel strap. Semi-float self-aligning action assures proper seating.

SEND YOUR INQUIRY TO
Porcelain Products, Inc.
PARKERSBURG, W. VA.

Anchor (406)

Oliver Iron & Steel Corp. has a new earth-expanding pole line anchor, employing a pusher arm principle to prevent under cutting of the hole when expanding and minimize earth resistance to expansion. The housing for the blades provides a top and bottom plate which are locked together by means of a tube through the center of the plates. When pressure is exerted on the top of the blade housing, the blades expand uniformly at direct right angles and wedge solidly into the soil, the announcement states. Interlocking ridges on the blades and housing plates prevent a twisting action and provide equal distribution of holding power. Available in six sizes, including two- and four-blade styles, with ratings from 3,000 to 12,000 lb.



Service Body (407)

Artisan Products Inc. has announced model 60KD all-steel service body for carrying tools and materials to and from the job. It is for mounting on any late-model ½-ton chassis less rear fenders. Service body is designed for shipping partially knocked-down for final assembly and mounting at destination.

Combination Meter (408)

A combination polyphase watt-hour and thermal demand meter in a case no larger than the standard three-element watt-hour meter is offered by Westinghouse. It is designed for light industrial and commercial loads where it is desired to incorporate a demand feature within the rate. Available for three phase, three wire; three phase, four wire delta; open wye network; three phase, four wire wye in the unusual ratings of 5, 15 and 50 amp. at nominal application voltages of 120, 240 and 440. Comes in standardized A-base design.

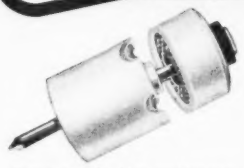
Resistor (409)

The Mallory Midgetrol Dual is a compact dual variable resistor for television and other applications; combines two controls on concentric shafts. It is 15/16 in. in diameter and, according to the manufacturer, makes it possible to move several key television adjustments from the rear to the front of the chassis.

Bus Bar Bender (410)

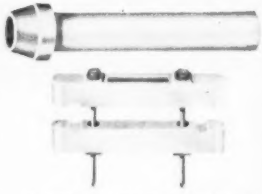
A portable bus bar bender has been introduced by Flexo Machines Co. It measures 18½ in. over-all; weighs 110 lb.; has capacity to bend bus bar up to 4 in. wide and ¼ in. thick to a 90° angle, the announcement states.

...and for
LOW VOLTAGE TOO!
call
Porcelain Products

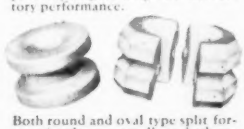


Dense, good looking, positive gripping ALLIGATOR Nail Knobs are preferred by electricians insisting on workman-like installations to build good-will and repeat business.

Outlet boxes with Adjustable Metal Mounting lugs and set of Hangers are nationally famous for durability, ease of installation and safety features.



A complete size range of tubes as well as 2 and 3 wire cleats are available for immediate delivery. Made precisely to give long and satisfactory performance.

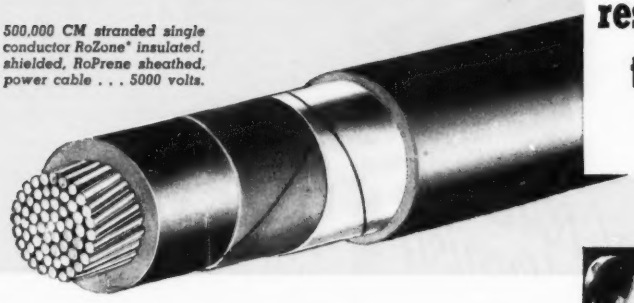


Both round and oval type split for-estry insulators as well as telephone insulators are available for immediate delivery.

SEND YOUR INQUIRY TO
Porcelain Products, Inc.
FINDLAY, OHIO

RoZone*

Rome's ozone-resistant insulation that surpasses specifications



500,000 CM stranded single conductor RoZone insulated, shielded, RoPrene sheathed, power cable . . . 5000 volts.*

RoZone*, an oil-base, ozone-resistant insulating compound, can be depended upon for service performance "above and beyond the call of duty" . . . a *plus* value assured by *plus* quality controls. In maintaining RoZone's high standard of quality there can be no half-way measures. That is why Rome Cable control of quality goes *beyond* specification test requirements . . . to make certain that every length of RoZone* insulated cable possesses that *plus* quality for dependable long cable life.

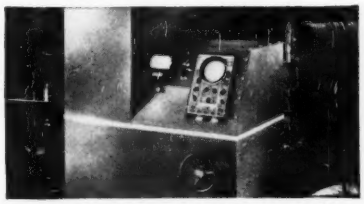
High electrical stability in wet locations, immunity to the effects of corona and ozone, high dielectric and surge strength, and low dielectric loss, place RoZone* in an unexcelled position for higher voltage applications. For circuits of 8000 volts, or less between phases, at operating temperatures up to 75°C, RoZone* will give you a new conception of cable performance.

RoZone* insulated cables can be supplied with or without electrostatic shieldings and are manufactured with RoPrene (Neoprene) sheath or other conventional cable coverings as specified. RoZone* is particularly recommended for series street lighting and power distribution circuits; motor, generator and transformer leads; as well as station control and other general purpose wiring where high quality is paramount.

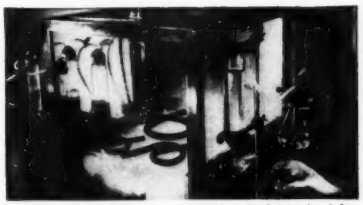
For complete engineering data write for your copy of Specification RO-4.

*TRADEMARK REGISTERED

Moisture resistance of insulated cable specimens is measured electrically in long time immersion tests.



Corona level of RoZone insulated cables is determined by means of this equipment.



RoZone's resistance to ozone cutting is determined by exposing specimens to ozone atmosphere.

FROM BAR TO FINISHED WIRE

ROME CABLE CORPORATION

ROME • NEW YORK

ROME CABLE ROME, N.Y.

PACIFIC COAST SALES OFFICES

SALT LAKE CITY 1, UTAH
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SEATTLE 4, WASH.
3404 Fourth Ave., So.

The big news in insulation is **HARVEL 1012C**...an outstanding development by **IRVINGTON** which provides an insulating varnish with *far greater bonding and cementing qualities than the numerous thermo-setting varnishes tested.* It's a very fast curing resin... absolutely oil-proof, and with excellent resistance to moisture and high temperatures. Unequalled for windings operating at high peripheral speeds as well as those subject to great stresses and strains.

Full information and generous test samples of HARVEL 1012C will be furnished on request. Write today.

STANDARD OF THE WORLD
IRVINGTON INSULATION
TRADE MARK REG. U.S. PAT. OFF.

IRVINGTON
Varnish & Insulator Co.
Irvington 11, New Jersey

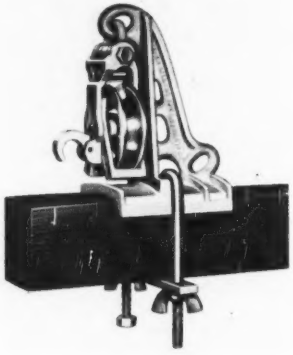
Authorized distributors in Baltimore; Berkeley; Bluefield, W. Va.; Boston; Charlotte; Chicago; Cleveland; Dallas; Denver; Los Angeles; Milwaukee; Minneapolis; New Hartford, N. Y.; New Orleans; New York; Philadelphia; Pittsburgh; Portland, Ore.; St. Louis; Seattle; Hamilton, Ontario, Canada.

Locking Plugs (411)

Russell & Stoll has a new line of Midget Ever-Lok automatic locking plugs, receptacles and cord connectors. The new units are smaller in size and feature protective hinged cover and gasket, strong spring to keep door closed and dusttight, solderless terminals with metal shield for protecting terminals. Contacts are precision formed and are self wiping and self aligning. Plugs automatically lock in receptables or connectors and have provision for positive equipment grounding. Adjustable cord grips eliminate strain on connections. All units are steel clad. All interiors are of molded arc-resisting composition.

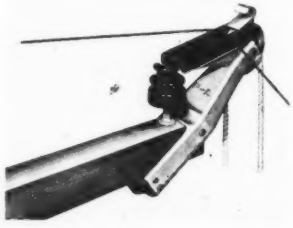
Wire Stringing Pulley (412)

Pieper-Lillard has a new wire stringing pulley which it states weighs $4^3/_4$ lb.; is easily handled and sturdy enough to be used as a transformer gin as well as for wire stringing and prestressing.



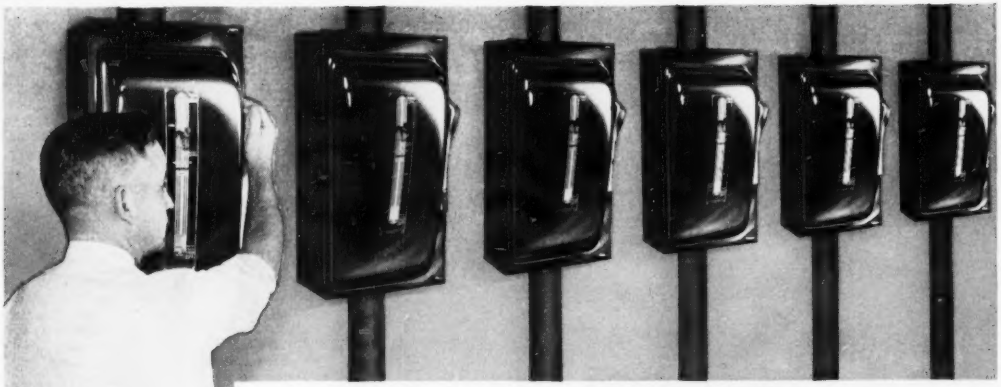
Lay-Up Gin (413)

Another new Pieper-Lillard product is a lay-up gin said to permit the man on the ground to do the entire job of lifting conductor from the ground and around arm end and placing it onto the insulator.

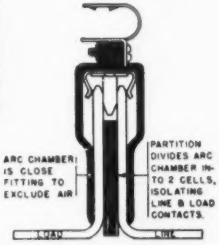


Transformers (414)

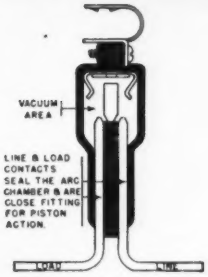
American Transformer Co. is offering a complete line of high-impedance transformers for filament excitation of large vacuum tubes. Designed for use with specific tubes, these transformers limit the inrush and operating currents to the values recommended by tube manufacturers, according to the announcement. Several ratings are furnished for certain tubes so that the designer may choose single or polyphase operation.



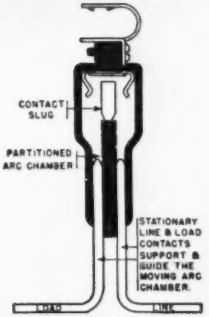
Operator checks a bank of Bull-Dog Vacu-Break Safety Switches • BullDog manufactures Vacu-Break Safety Switches • SafTo-Fuse Panelboards • Superba and Rocker Type Lighting Panels • Switchboards • Circuit Master Breakers • "Lo-X" Feeder BUS-tribution Duct • "Plug-In" BUS-tribution Duct • Universal Trol-E-Duct for flexible lighting • Industrial Trol-E-Duct for portable tools, cranes, hoists.


ARC CHAMBER IS CLOSE FITTING TO EXCLUDE AIR
PARTITION DIVIDES ARC CHAMBER INTO 2 CELLS, ISOLATING LINE & LOAD CONTACTS.
LOAD
LINE

IN FULL "ON" POSITION, the partitioned arcing chamber carries the free-floating contact slug in perfect alignment between the "LINE" and "LOAD" contacts. The "Clampmatic" pressure springs assure contact tight as a bolted connection for cool, efficient operation.



RUPTURING THE CIRCUIT, the quick outward movement of the housing on the close-fitting stationary contacts creates a piston action, reducing the amount of air in the arcing chamber. Simultaneously, magnetic blow-out force throws the arc away from the contacts and against the chamber walls for final dissipation.



IN FULL "OFF" POSITION, the stationary "LINE" and "LOAD" contacts remain partially inserted in the enclosed arcing chamber, effectively sealing them against dust and dirt.

Switch principle that pays off in protection

WHAT makes these safety switches really safe?

The answer is simple: They are BullDog Vacu-Break Safety Switches, and utilize an exclusive principle of arc control and positive contact.

With the Vacu-Break principle, there is no chance of dangerous, uncontrolled arcing. Electrical contact is made and broken in a special arc-resistant chamber of limited space. Incipient arcs are quickly smothered by lack of oxygen.

The Vacu-Break arc-snuffing principle ends excessive burning and pitting of contacts, thus greatly reducing maintenance and prolonging switch life.

Another feature of BullDog Vacu-Break Safety Switches is patented "Clampmatic Contacts." Strong metal "fingers" close tightly on contacts when switch is thrown ON. Power flows smoothly through silvered-copper conductors; bolt-tight connection keeps contacts cool for efficient operation.

You will want to see a BullDog Vacu-Break Switch in operation. Call your nearby BullDog Field Engineer . . . he will be glad to show you an installation in your neighborhood.

BullDog Field Engineers welcome the opportunity to sit in with you in the early planning stages of a building project. Their knowledge of electrical distribution layout can mean savings in installation costs, as well as efficiency and reliability in actual operation. Why not take advantage of this service?

BULLDOG ELECTRIC PRODUCTS COMPANY

DETROIT 32, MICHIGAN • FIELD OFFICES IN ALL PRINCIPAL CITIES

IN CANADA: BULLDOG ELECTRIC PRODUCTS OF CANADA, LTD., TORONTO

BULLDOG

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Safety Switchboard Company
1445 Stevenson St. Tel. Hemlock 1-2470
San Francisco 3, Calif.

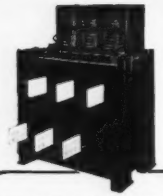
Mullenbach Electrical Manufacturing Co.
2300 East 27th Street Tel. Logan 5-5331
Los Angeles 11, Calif.

NEW AIR-COOLED
DISTRIBUTION TRANSFORMERS

POLE MOUNTED — OUTDOOR — ALL-PURPOSE — INDOOR — WALL MOUNTED

LIGHTER! SMALLER! SAFER! MORE ECONOMICAL!

MARCUS SCORES AGAIN IN THE FIELD OF AIR COOLED TRANSFORMERS



From a Pioneer in the field comes a new distribution transformer—AIR COOLED, DRY TYPE. No hazardous oil or toxic liquids to fuss or bother with. The use of superior class B and C heatproof insulation such as fibre-glass, mica, porcelain, new Johns-Manville Quinterra and similar inorganic material results in a transformer that can withstand the overloads that normally would damage an ordinary class A (cotton and paper) insulated oil filled unit. The entire transformer element is seal protected against oil, acids, moisture, etc., and is housed in a sturdy, scientifically ventilated, weatherproof case which conforms with all applicable EEI-NEMA construction standards. This extremely versatile transformer can be used outdoors, pole or platform mounted or indoors at the load center, mounted wherever convenient with no expensive fireproof vault required.

Currently available in sizes to 100 KVA, voltages to 5000 V.

AIR-COOLED TRANSFORMERS
1 to 2,000 KVA up to 15,000 Volts to meet Individual Requirements
- DISTRIBUTION
- GENERAL PURPOSE
- PHASE CHANGING
- ELECTRIC FURNACE
- RECTIFIER
- WELDING
- MOTOR STARTING

COMPETITIVE PRICES • GOOD DELIVERIES
WRITE FOR BULLETIN #49-ACO

MARCUS TRANSFORMER CO. INC.
40 MONTGOMERY STREET
HILLSIDE 5, NEW JERSEY

PIONEERS IN THE FIELD OF AIR-COOLED TRANSFORMERS

Sales Representatives:
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Seattle 4, Washington
E. B. COOK COMPANY
San Francisco, California
ROBERT A. YOUNG & COMPANY
Los Angeles 15, California

Control Circuit Transformer (415)

Square D has announced Class 9070 type A control circuit transformers for use with industrial control equipment. The manufacturer claims the low impedance values of the transformer windings result in unusually good transformer regulation during peak current periods. To provide secondary protection, either one or two fuse and bracket assembly units can be mounted directly on the transformer.

According to the manufacturer, these control circuit transformers are compact in design, easy to mount and are built especially for front-wired control panel use. Accessible screw-type terminals permit panel wires to run directly to the transformer, avoiding splices. Available in 50, 100, 150, 300 va. at either 50/60 or 25 cycles, and 500 va. at 50/60 cycles, with primary voltages of 220-440 (dual voltage), 550, 440, 380 and 220, and secondary voltages of 110 or 24 volts.

Distribution Transformers (416)

Westinghouse has a line of CSP 3-phase distribution transformers for small industrial or commercial loads. The new units have De-ion lightning arresters, three mechanically interlocked, heavy-duty circuit breakers on the secondary side as safeguards against overloads, and short circuits and primary protective links for system protection. Available in sizes 9, 15, 30, 45 and 75 kva. for primary voltages of 2,400 to 14,400 inclusive and with secondary voltages of 208Y/120, 240 delta, 240 by 480 delta for the primary classification in accordance with present standards.

Capacitors (417)

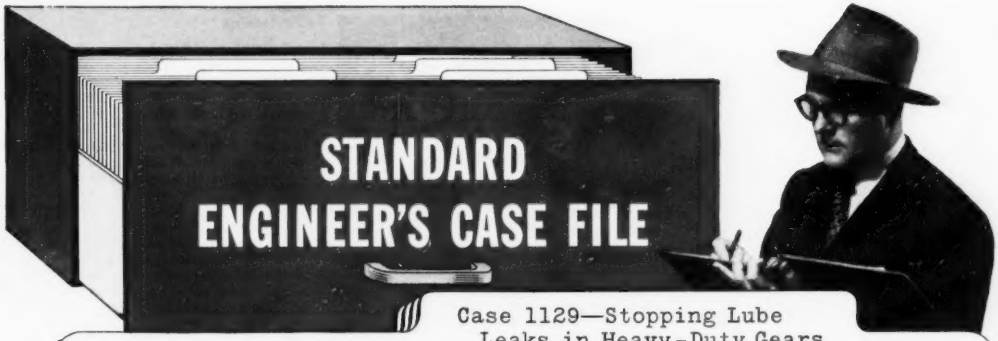
Moloney Electric has single-phase Askarel-filled capacitors meeting EEI-NEMA standards and available in 15 and 25 kvar. and in all voltage ratings from 2,400 through 13,800. These capacitors are in heavy-gage welded steel cases hermetically sealed.

Demand Registers (418)

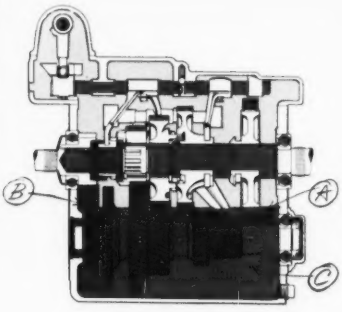
A new line of demand registers of simplified construction is available from G-E in two models: the indicating type, M-30 and the cumulative type, M-31. The latter has, in addition to an indicating dial, a set of four dials for accumulating the demand in kilowatt-hours from one reading period to another. Both types make use of a Geneva mechanism for the interval resetting operation. This enables the timing motor to reset the pointer pusher by direct-drive gearing without shock, eliminating need for spring and latch mechanisms, the manufacturer states. Both registers may be used to convert new G-E watt-hour meters into watt-hour demand meters.

Terminal Block (419)

The new solderless-type Bepco molded terminal block is said to eliminate need for wrapping wires around studs or applying terminals to wire ends. These blocks have compression-type solderless units, each capable of receiving wires from No. 16 to 6 AWG. Typical combinations that may be accommodated by a single terminal are two No. 10, two No. 12 or two No. 14; one No. 12 with one No. 10, one No. 12 with one No. 14, etc. Wires are attached by tightening screws after insertion of stripped wires. Rated at 35 amp., 600 volts, come in 4-, 8-, 12-circuit sizes. Screw-on covers available. Manufactured by Buchanan Electrical Products Corp.



Case 1129—Stopping Lube Leaks in Heavy-Duty Gears



HEAVY-DUTY TRANSMISSION

Because compounded RPM Gear Lubricant will not foam, it eliminates a common cause of leakage from gear cases on trucks and other machines working in extreme conditions of temperature and load. Comes in four grades: SAE 80, 90, 140, 250. For spur, spiral and automotive worm gears. (For hypoids, use RPM Multi-Service Gear Lubricant.)

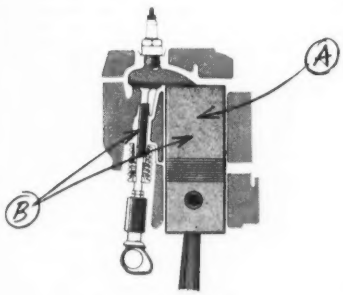
A. Contains foam inhibitor — prevents retention of air whipped into lubricant by rotating gears; breaks bubbles that form.

B. Oiliness compound helps provide tough lubricating film — withstands shock and overloads.

C. High resistance to oxidation prevents deposits; assures lubrication in extreme temperatures.

The stability and high lubricating qualities of RPM Gear Lubricant (Compounded) provide outstanding lubrication for bronze worm gears.

Case 1117—Preventing Starting Wear in Gasoline Engines



GASOLINE ENGINE PISTON AND VALVE

Engines lubricated with RPM Motor Oil had a film of oil on cylinders, valve stems and other parts at all times, even when idle. The film provided lubrication from the instant the engines started to turn over. Recommended for all gasoline engines. Comes in seven grades: SAE 10/10W to SAE 70.

A. Special compound keeps lubricant on hot or cold metal — reduces wear and protects against corrosive moisture in engines.

B. Detergent cleansing agent loosens and removes carbon, gum and lacquer from all parts . . . keeps rings free. Contaminants stay dispersed in the oil and flow out with drainings.

RPM Motor Oil contains other compounds which prevent corrosion of any bearing metal, resist oxidation and stop foaming.

Trademark Reg. U. S. Pat. Office

STANDARD TECHNICAL SERVICE will make your maintenance job easier. If you have a lubrication or fuel problem, your Standard Fuel and Lubricant Engineer or Representative will gladly give you expert help; or write Standard of California, 225 Bush St., San Francisco 20, California.

RPM

FOR EVERY NEED A **STANDARD OF CALIFORNIA** JOB-PROVED PRODUCT

THE MAGNO-TRONIC FLUORESCENT STARTER

PROTECTS Fully automatic thermal relay with unusually long life that eliminates blinking lights and protects all auxiliary equipment.

SIMPLIFIES Replacement of worn-out lamp automatically restores closed circuit—replacement of starter unnecessary. No button to push.

REDUCES COSTS Magno-Tronic starters provide exact timing in the lamp electrode—preheating process preventing excessive loss of emission material thereby assuring the maximum in the useful life of a lamp. The established quality of this starter saves considerable time in maintenance and man hours required to repair and/or replace an inoperative lighting unit.

VERSATILE Will operate efficiently over an extended voltage under widely varying temperatures.

GUARANTEED FOR ONE YEAR

The (SP-15-20) for use with either 15 or 20 watt lamps
The (SP-30-40) for use with either 30 or 40 watt lamps
The (SP-100) for use with 100 watt lamps

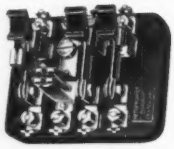
Ask for descriptive literature

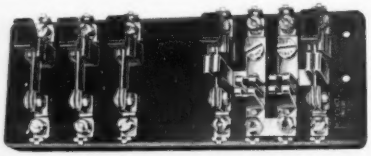
INDUSTRIAL ELECTRONICS CORP.

MAIN PLANT Newark 2, N. J.

KNIFE TYPE SWITCHES

Long life, perfect action, speedy, safe . . . those words describe our attractive, highly developed knife type METER TEST SWITCHES for single or polyphase circuits. With or without covers, front or back connected.





#536 for front or back connection. Used frequently for relay circuits.

#502 for 3 phase, 3 wire Meters with instrument transformers.

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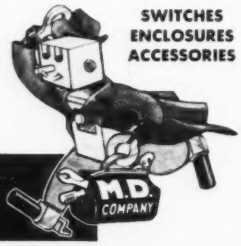

SWITCHES
ENCLOSURES
ACCESSORIES

METER DEVICES
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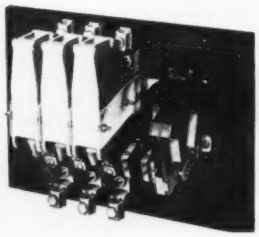
Contactors (420)

Ward Leonard has developed Bulletin 4454 size 4 and 4455 size 5 a-c magnetic contactors for motor, heater and lamp control. Standard on these 150- and 300-amp. contactors, the manufacturer states, are: movable and stationary contacts on both sizes identical and interchangeable; removable cold molded arc shields for all main poles; a new magnetic circuit permitting positive operation over a wide range even under fluctuating line voltages; accessible solderless clamp-type connectors for line and load terminals; standardized mounting panels.

Size 4 contactors are available with a maximum of five main poles and size 5 with two or three poles only. Both sizes can be supplied with open-type construction or with NEMA type 1 enclosures. Coils are available for operation on 110, 208-220, 440 and 550 volts on frequencies of 25, 50 or 60 cycles. Maximum enclosed power rating for size 5 is 200 hp., 550 volts, three phase, 60 cycles.



Dynamometers (421)

Wagner has announced hydraulic dynamometers for load-testing of motors. Tests that can be made with this device include idle, pull-in, pull-up, full-load and locked. The dynamometer is foot controlled; exact foot-pounds of torque may be read directly from the gage furnished.

Assembly SA-483 is of 30 ft.-lb. capacity and has adapters for $\frac{1}{2}$-, $\frac{5}{8}$-, $\frac{3}{4}$- and 1-in. motor shafts; comes fully assembled on a steel bench top, approximately 36-in. square, which may be mounted on standard steel bench legs or on existing benches in test or assembly lines. Foot-control cylinder may be placed in the most convenient location. Other dynamometers are available as follows: SA-484, 30 to 300 ft.-lb. capacity, with adapters for $1\frac{1}{8}$-, $1\frac{1}{4}$-, $1\frac{3}{8}$-, $1\frac{7}{8}$-, $2\frac{1}{8}$-, $2\frac{3}{8}$-, $2\frac{5}{8}$- and $2\frac{7}{8}$-in. motor shafts; SA-485 is a combination of the 30-ft.-lb. and the 30- to 300-ft.-lb. machines. Units are built to order only and can be delivered approximately 60 days after receipt of order, the announcement states.

HERE COMES THE

Trumbull Train

OF ELECTRICAL PROGRESS

A whole parade of new Trumbull products is headed your way! A new advancement in the entire line of Trumbull products — Flex-A-Power systems, Panel Boards, Control Centers, Switches and Motor Starters — all radically different. So watch for Trumbull's new product announcements during 1949. Here's the first —

A NEW

Magnetic Motor Starter and Magnetic Contactor

New, from top to bottom, Trumbull Starters and Contactors in sizes 0, 1, 2, 3 give maximum protection to motors up to 50 hp, 440 v. Look at all their important new advantages:

LONGER CONTACT LIFE —
Actual factory tests show the silver contacts on the Trumbull starter "make and break" for millions of operations — many times more than any starter on the market.

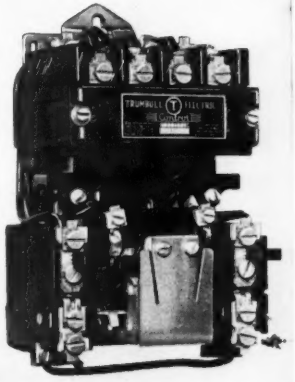
EASY TO MAINTAIN —
Silver contacts have permanently attached springs that are easy to remove. Terminals are located on the front and are easy to wire — a screw driver is all you need to disassemble starter — can be accomplished in less than a minute.

EASY TO INSTALL AND SERVICE —
Note convenient knockouts, large terminals, front connections, and ample wiring space.

GREATER PROTECTION —
Bi-metallic relay heaters follow motor's heating curve. Easily adjusted for automatic or manual reset.

BUILT TO LAST —
All parts resist corrosion and moisture. Examine plastic coil enclosure to see how the tough varnish impregnation protects windings. Contact points and cold-molded asbestos arc hood eliminate arcing . . . give clean "make and break" contact.

QUIET OPERATION —
Permanent lubricant impregnated in the plastic coil enclosure keeps magnet guides sliding smoothly . . . eliminates low voltage "chatter."

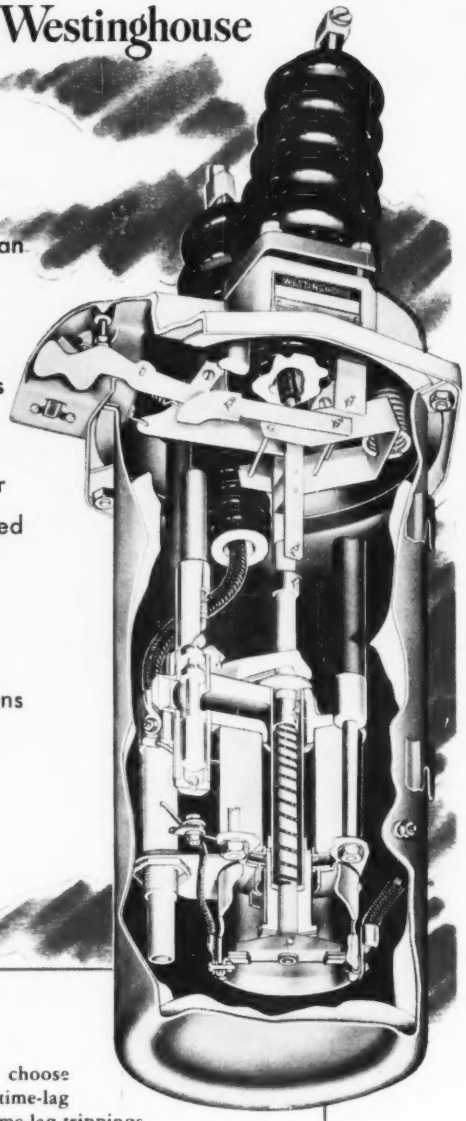


FOR MORE INFORMATION about this latest Trumbull development, write for Circular TEC 11. THE TRUMBULL ELECTRIC MANUFACTURING CO., Plainville, Conn. Other factories and offices throughout the United States. Foreign representation.

Men Who Observe the Best Electrical Practice Make It a Practice to Use

TRUMBULL (T) ELECTRIC

YOU CAN BE **SURE** IF IT'S Westinghouse



THE WESTINGHOUSE GR RECLOSER gives you every advantage for suburban and rural service. Its **SIMPLIFIED OPERATION** is matchless—no clocks, gears, pumps, flags, bells or complicated adjustments. It has **FEWER MOVING PARTS** than any other recloser available today. The galvanized tank and top give you dead tank construction with no live parts except top terminals. "De-ion" interrupter on contacts, plus ample oil capacity, means **LONGER SERVICE** without oil change. The GR Recloser gives you every operating benefit you want and it's **SAFE, STURDY, EASY TO CHECK**

WHAT'S MORE,

it offers versatility because you can choose between two types of operation; 4 time-lag trippings to lockout or 2 fast and 2 time-lag trippings to lockout. And you can switch from one to the other in the field. Only the GR Recloser gives you all these advantages. Get complete information from your nearest Westinghouse office or Westinghouse distributor, or write for booklet B-3906 and A.D. 38-680. Address Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa.

J-60678

Westinghouse GR RECLOSERS

PLANTS IN 25 CITIES ... OFFICES EVERYWHERE

Socket Protector (422)

Adjustable Fixture Co. has announced the Ajusco-Loc socket protector claimed to provide maximum protection against breakage. According to the announcement, it may be used on most medium-base brass shell sockets. The assembly consists of a solid die-cast cap with a minimum wall thickness of 3/64 in., a 16-gage steel ring and three brass screws. It is installed by placing socket body in cap, sliding steel ring over socket body until it rests on socket shoulder and slipping the three screws through the holes in the ring and screwing into cap. Die-cast lug inside of cap fits into switch-button slot in socket shell to prevent twisting. Available in ¼- or ⅜-in. IP thread as a separate assembly or complete with pull chain, key or push through socket. Patent applied for.

Down Light (423)

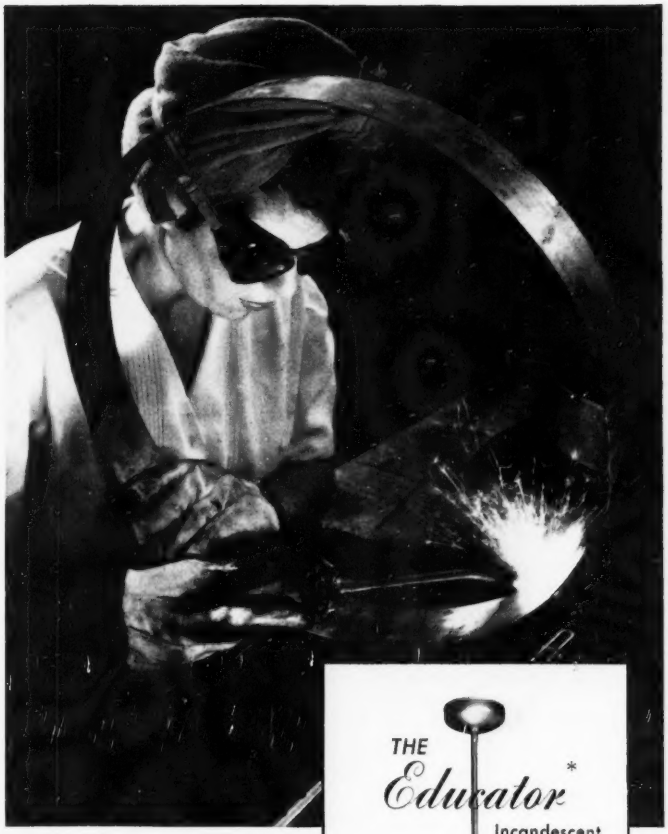
A down light called the Calcu-lite has been introduced by Lightolier, which claims that it steps up the light output by reflector and lowers surface brightness by use of a patented colouvered lens, the verticals of which are opaqued with ceramic coloring. The lens itself is a little above ceiling level to further aid in minimizing glare. Lens are available with black, coral or white vertical risers. According to the manufacturer, the light has a cone of useful light of about 45°, midway between usual spot and flood beams. For commercial and residential use, sizes range in diameter to accommodate bulbs from 75 to 500 watts.

Lampholder (424)

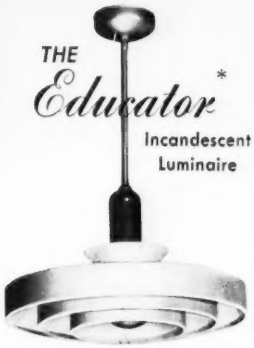
S & M Lamp Co. is offering a new PAR-type lampholder with universal adjustment construction for projecting light in any direction. A slot in the curved section of the bracket tightens to position with a twist of the wing nut.

Lamps (425)

Two new 75-watt medium-screw base lamps in PAR-38 bulbs have been developed by Westinghouse. One is a projector-spot, the other a projector-flood; both are designed for an average life of 1,000 hours. They operate on 115, 120 or 125 volts; are designed for outdoor or indoor use; have precise-beam control.



THE *Educator** Incandescent Luminaire



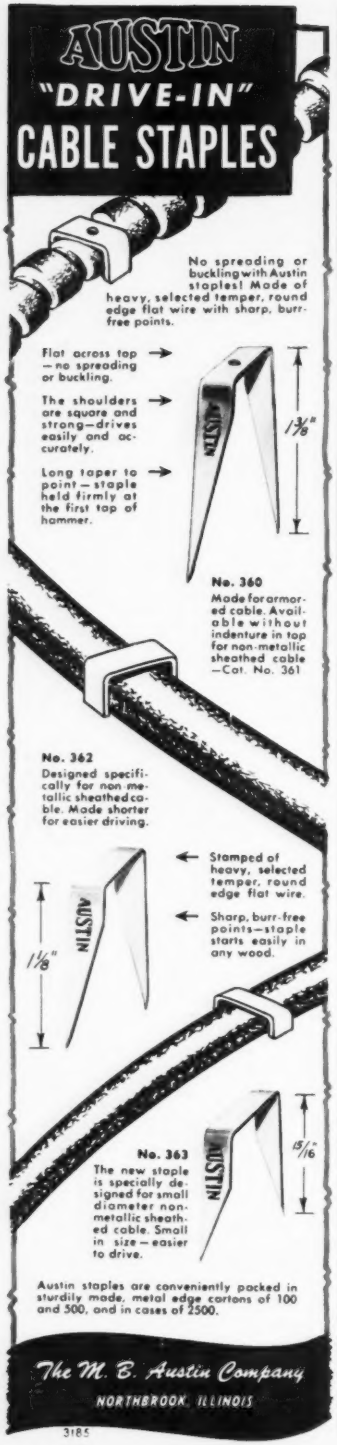
*PATENTED

Her torch will help light up school rooms!

Yesterday a strip of steel — tomorrow a special new luminaire developed to meet the exacting requirements of the schoolroom, the drafting room, the modern office. Wherever ideal vision is vital, the Educator will provide correct intensities of indirect light at the proper level, eliminating glare and annoying shadows. Result? Less strain — better work — and no place for waste or dust to accumulate!

SMOOT-HOLMAN COMPANY
SMOOT-HOLMAN
INGLEWOOD CALIFORNIA
MADE IN U.S.A.

Offices in Principal Western Cities—Branch and Warehouse in San Francisco


AUSTIN
"DRIVE-IN"
CABLE STAPLES
No spreading or buckling with Austin staples! Made of heavy, selected temper, round edge flat wire with sharp, burr-free points.
Flat across top—no spreading or buckling.
The shoulders are square and strong—drives easily and accurately.
Long taper to point—staple held firmly at the first tap of hammer.
AUSTIN
1⅜"
No. 360
Made for armored cable. Available without indenture in top for non-metallic sheathed cable—Cat. No. 361
No. 362
Designed specifically for non-metallic sheathed cable. Made shorter for easier driving.
Stamped of heavy, selected temper, round edge flat wire.
Sharp, burr-free points—staple starts easily in any wood.
AUSTIN
1⅛"
No. 363
The new staple is specially designed for small diameter non-metallic sheathed cable. Small in size—easier to drive.
AUSTIN
15/16"
Austin staples are conveniently packed in sturdily made, metal edge cartons of 100 and 500, and in cases of 2500.
The M. B. Austin Company
NORTHBROOK, ILLINOIS
3185

BULLETINS ETC.

Fuse Switches (426)

A new bulletin from W. N. Matthews Corp. illustrates and describes wood-housed Fuswitches in ratings of 50, 100 and 200 amp., 5,000 and 7,500 volts. Included are reprints of oscillographs showing these Fuswitches clearing shorts in excess of 8,000 amp. at 4,150 volts. They will interrupt higher capacities at 2,400 volts. Also contained in the bulletin is information on three porcelain-housed Fuswitches and cutouts.

Load Centers (427)

A new 4-page leaflet, "MO-2 and MO-4 Multibreaker Loadcenters," has been announced by Westinghouse. Purpose of the leaflet is to announce the availability from stock of these additions to the Westinghouse line of loadcenters. The advantages of the loadcenters for both home and farm owners are discussed, and the new design features that provide for quick and easy installation and for better protection are described.

Antenna (428)

L. S. Brach Mfg. Corp. has issued a loose leaf catalog, No. 1304, giving details of its TV and FM antennas, accessories, and other equipment.

Circuit Breaker (429)

Pacific Electric Mfg. Corp. has issued catalog 580 on its 115-kv. 5-cycle trip-type JWE-58 oil circuit breaker with motor-compressed-spring operating mechanism.

Lighting (430)

Smithcraft is offering a booklet showing features of its shallow and deep troffers and explaining the function of its aligner hanger, a development to permit leveling and adjusting the troffer after installation.

Removable Ceiling (431)

General Electric Supply Corp. is offering a pamphlet on Louver-Lock removable ceiling panel for lighting.

Capacitors (432)

Cornell-Dubilier is offering a new booklet on pole-type capacitors, containing data, detail drawings of capacitors and mounting brackets, cut-out illustrations of construction details.

Motors (433)

Features of Allis-Chalmers totally enclosed fan-cooled motors with tube-type air-to-air heat exchangers are described in a bulletin offered by that company.

Contacts, Brushes (434)

Superior Carbon Products Inc. has issued catalog S-104, a four-page folder on silver graphite and silver alloy contacts and brushes.

Instrument (435)

In bulletin 55, James G. Biddle Co. describes its new instrument for measuring turn ratio in power transformers. Illustrated.

Instrument Transformers (436)

An 80-page illustrated booklet published by G-E contains information on 107 types of standard instrument transformers. Prices, ratings and ASA accuracy classifications are given.

ELECTRICAL WEST, 68 Post St., San Francisco 4, California
Please send me information about following CIRCLED items:

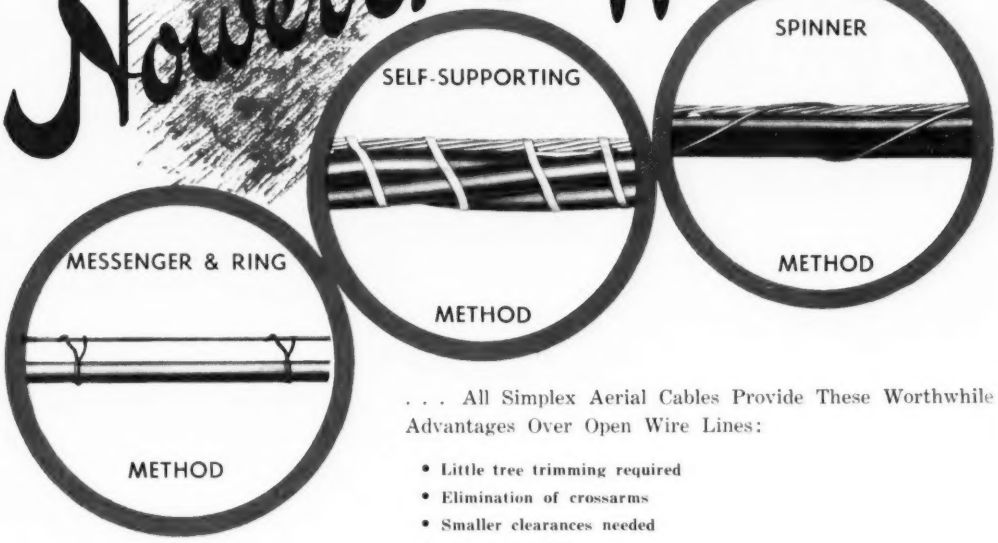
400	401	402	403	404	405	406	407	408
409	410	411	412	413	414	415	416	417
418	419	420	421	422	423	424	425	426
427	428	429	430	431	432	433	434	435
436								

Name ..... Company* ..... Title* ....

Address .....

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

However Supported



. . . All Simplex Aerial Cables Provide These Worthwhile Advantages Over Open Wire Lines:

- **Little tree trimming required**
- **Elimination of crossarms**
- **Smaller clearances needed**
- **Less congestion**
- **Better appearance**
- **Fewer service interruptions when exposed to winds, icing, lightning, and moisture**
- **Lower reactance; Better regulation**
- **Higher safety factor for linemen and for people and property below**
- **Lower maintenance costs**

Simplex Aerial Cables are available for power, communication, and control systems of utilities, industries, railroads, police and fire departments.

They can be insulated with the famous moisture-resistant Anhydrex insulation, or with paper, varnished cambric, or polyethylene in order to meet the demands of each type of service. They are protected by either a neoprene jacket, a lead sheath, metallic tapes, treated braids, Plastex or polyethylene jackets, depending on the insulation used and upon service conditions.

The type of cable and method of installation should be decided upon only after a careful study of service requirements. Simplex engineers are always on hand to help you. Feel free to write for their assistance at any time.

SIMPLEX WIRES & CABLES

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

ELECTRA'S HUSBAND

THE COMPETITIVE FACTS OF LIFE

THE moment I walked in the kitchen door I knew that Electra was burned up about something. The air was charged just as though the electric range had been a small cyclatron. Only the effect in this instance probably came from her red hair and Irish temperament.

"Do I take my hat and coat off first, or will you explode now?" I suggested by way of easing the tension.

"It doesn't matter," she fumed. "But if you ever catch me going into Blank's store again, I hope you send me to a psychiatrist."

"What's happened now?" I asked. "I always thought you liked to shop there."

"Well, you are going to go on living with the faded curtains and worn draperies in the living room," she said as she followed me into the hall. "Two weeks ago I stopped in Blank's and went into the drapery department. I told a salesman what I wanted and he showed me some samples. I picked out the materials for the curtains, but the draperies proved more difficult. Finally the choice narrowed down to two patterns. And if you had not been busy that day, I would have brought samples down for you to choose one or the other.

"Anyway we settled the matter in a satisfactory way, I thought. The salesman couldn't give me a price on the curtains because there was no one in the workroom to make up an estimate. So he wrote up the order and said he would phone me the price for confirmation. And he said he would be out on Wednesday with the drapery samples so we could hang them and decide which was better."

"What was wrong with that?" I asked. "It sounds like a good arrangement."

"It was, only that it was two weeks ago and up until this morning I hadn't heard from or seen that salesman," Electra continued. "So this morning I went down town and dropped into Blanks. I found the salesman. Yes, he had the order, but he had not found time to send it up for an estimate. As for the drapery material, he had my name written on slips of paper and pinned to each piece. He wondered why I had not returned and told him which one I wanted."

"What did you do?"

"I asked him for the order and I tore it up. Then I told him to take one of the pieces of drapery and tie it around his neck until he choked. Then I walked out of the place, and if I ever go back, I hope someone shoots me."

"But obviously he was a new salesman," I said.

"That's what *you* think," she countered. "He sold me the draperies and curtains in the back bedroom before the war. And he sold me the draperies in the dining room three years ago."

By a strange coincidence I had attended a meeting just a few days before this diatribe of Electra's and had chatted with Blank about business conditions. His pessimism was as thick as a tule fog. Business was just plain rotten, according to him. And it was only a question as to which day you selected as to whether the appliance department, the home furnishing goods department or the rugs and draperies had the worst showing.

I told this to Electra.

"No wonder," she commented. "If his salesmen let very many three or four hundred dollar sales walk out of the store like they did me, he'll wake up some morning with the bank or the sheriff running his business. But then you get the same kind of treatment almost everywhere. If the country goes into a tailspin, maybe the so-called salesmen will be to blame."

"Put some of it on the sales managers too," I said. "There are a lot of people taking orders today who never had to sell. They might let you have something if you came in next week or next month or if you were a particularly good friend. 'Selling virgins' is what Larry Wray of *Electrical Merchandising* calls them—utterly ignorant of the competitive facts of life. Somebody, and it should be their sales manager, ought to set them straight. Money doesn't get into their pockets by some simple process of osmosis. They've got to sell to earn it. Probably half of the people in sales jobs today never had to sell against competition. They've only taken orders during and since the war."

"Yes, but the fellow in Blanks who waited on me was an oldtimer," Electra interrupted. "He ought to know better."

"He's a selling libertine," I continued. "He has just grown careless about the competitive facts of life. He knows them so well he's forgotten that it ever was necessary really to buckle down and sell. It would be too bad if we must go through some sort of a business recession to wake them up."

"Maybe if all of the so-called salesmen would truly sell and the sales managers really manage, there wouldn't be any recession," Electra mused.

To which I answered, "Amen."

SOME of us were talking at lunch the other day about how valuable it would have been if somewhere in our formal education there had been just one course in psychology. Engineers, for all of their trained minds, seldom are expert in human relations. One of the reasons, obviously, is that they have to learn human relations the hard way. The semi-extroverts, the ones who take up selling as a career, may become experts. But they are the exception.

One of our table companions put it succinctly. In preparing to make the commencement address at a small engineering school, he wrote to a number of engineering friends and asked two questions: "What was the most valuable advice given you when you were graduated?" and "What advice do you wish you had been given instead?"

The best answer, he reported, came from an engineer who had become eminently successful. This chap wrote: "When I was graduated, the president of our college told us to seek always to know *what* men think. What he should have told us was to know *why* they think that way."

Select from Complete Line OF STANDARD RATINGS!

KVA	4800 VOLT AND BELOW	7200 VOLT AND UP
3-25	—	CBS-1
3-100	PBS	CBS
167-500	CBS	CBS

KEY TO TYPE DESIGNATION

CBS-1 Single high voltage cover bushing with low voltage stud bushings in tank wall.

PBS High voltage pocket bushings with low voltage stud bushings in tank wall.

CBS High voltage cover bushings with low voltage stud bushings in tank wall.

Type CBS-1 Type PBS Type CBS

Allis-Chalmers Distribution Transformers

EVERY RATING AND DESIGN of distribution transformer listed in the Fourth Report (1948) of EEI-NEMA can be supplied by Allis-Chalmers!

Size and weight of these transformers have been reduced as much as ⅓, making them easier to handle during installation.

All tanks are given Spra-Bonderized surface treatment . . . a hot dip phosphate process which protects against corrosive atmospheres.

Heavy gauge steel tanks are seam welded and pressure tested at 50 psi. to insure permanent protection against leaks.

For more details about these and other features of Allis-Chalmers distribution transformers, ask your nearby sales representative for the complete 12-point construction story. Or write for bulletin 6159A. A 2637

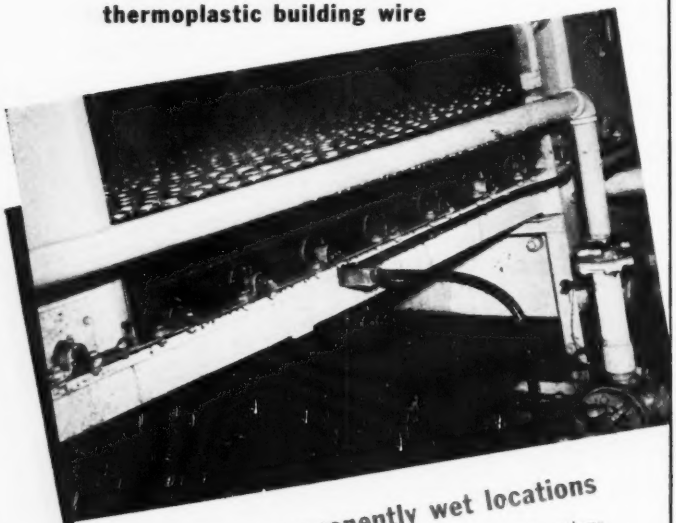
ALLIS-CHALMERS, 939A SO. 70 ST.
MILWAUKEE, WIS.

ALLIS-CHALMERS

Pioneers in Power and Electrical Equipment From Generation Through Utilization

WHAT IT MEANS TO WIRE WITH TYPE TW

GENERAL ELECTRIC TYPE TW
The first . . . and foremost thermoplastic building wire



for wiring permanently wet locations

When "specs" call for a wire to be used in wet locations where moisture is likely within the raceway—underground or in concrete slabs . . . in masonry in direct contact with the earth—*the* wire to use is General Electric Type TW. This top-quality wire is underwriter-approved in sizes No. 14 to No. 0000 Awg for use in raceways in these wet locations, and in sizes No. 14 Awg to No. 2000 MCM for open wiring.

In addition to the flame- and moisture-resistant qualities of General Electric Type TW, it is also resistant to oils, acids, and alkalies.

So for those tough wiring jobs remember General Electric Type TW. It's easy to strip, easy to pull, clean to work with.

Send for free booklet

The new free booklet, *Building Wires, Cables, and Cords for every purpose* gives more detailed information on Type TW and the rest of the General Electric line. For your free copy address Section W19-425 Construction Materials Department, General Electric Company, Bridgeport 2, Conn.

GENERAL ELECTRIC

AROUND THE CIRCUIT WITH YOUR G-E MERCHANDISE DISTRIBUTOR

Was asked about BX the other day by a young fella just starting in the trade. I thought everybody knew all about **General Electric BX® armored cable:** that it was extremely flexible and easy to handle and that it goes in to last. When I checked my handbook, I found another feature I'd overlooked. In sizes 12 and 14, it's smaller and lighter in weight than ever before, with a special bonding strip to insure adequate ground.

Did you know that **service entrance cable** (Type SE—Style U) can be installed directly on the outside of a building without conduit? You can even paint the flame-retardant, moisture-resistant cotton braid if you want to. Another nice thing about this high-quality product is that, on short spans, you can run it from the pole right through to the meter equipment.

Had a call from Bill Brown for some information on the wiring of his new livestock barn. One of the requirements was that the cable had to withstand weather extremes, and fumes and corrosive vapors. I told him the General Electric people must have had him in mind when they designed **Super PVX® nonmetallic sheathed cable.** This top-quality cable is for those difficult jobs where easy installation and long service life under the worst conditions are important. Super PVX comes in ivory or brown color to give a trim, neat appearance on surface wiring jobs. Stop by for a sample.

WIRES AND CABLES

ELECTRICAL WEST
SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

Poor Relations?
Not Unless We Make Them So

R. H. Cockfield*
Manager, Residential Sales,
Los Angeles Department of Water & Power

BECAUSE it's about *your* business, not mine, I'm not so sure now that I want to make this talk. You know a lot more about your business than I *ever* will. I could give you a lot of high-sounding phrases that wouldn't mean anything and probably get away with it. But, if tomorrow is to be any better than today, we had better face today's issues fairly and squarely, because tomorrow will be only as good as we make it.

In calling on some of you dealers and distributors for material, I find that the one thing that is uppermost in the minds of all is the price situation. But the significant thing is that dealers blame the distributors and the distributors blame the dealers *and* the manufacturers. The dealers claim the distributors franchise too many outlets, load them with merchandise, then force collections. The distributors say that, if the dealers were on their toes, they'd give the distributors the volume they need without so many outlets and wouldn't get caught with an over supply.

Now you two groups are married to each other in this business and I don't propose to participate in any family quarrels. If you ask me, there isn't a single one of us—manufacturer, distributor, dealer, *or* utility—that's lily pure. So let's admit we could all be at least partly to blame for the situation we are in and that none of us, individually or collectively, have done very much to improve it.

Before we go too far there are a few *other* things we'll have to admit.

1. That this is America, and every manufacturer, distributor, chain store, department store, jewelry store, neighborhood dealer, and even the discount house has just as much right to go in business as you have, and has just as much right to run *his* business the way *he* thinks best as *you* have to run *your* business the way *you* think best.

2. That every business, wholesale or retail, large or small, is run by a human being who has a job to do. He is in business to make a profit and his actions and decisions are made on the basis of the facts, *not* as they are, but as they *seem* to him to be. Therefore, if his actions are to be changed he will have to be *sold* that he and his firm would profit by changing them.

3. That right sometimes takes force to prevail, but force never permanently settled anything that wasn't right. Democratic methods still work and improvements in our industry will be effected best and most lastingly only when they are brought about through open-minded collaboration.

Now, if we understand each other, let's for a few minutes look at the fundamental concepts of each of our groups, not through our eyes but through theirs.

Equipment starts with the manufacturer, so let's start there too. Whether his plant is in California or Kalamazoo, his problem is the same. He saw the tremendous backlog of radio and appliance demand, and invested his and his stockholders' money in new plants and plant equipment, and in increased manufacturing capacity.

A recent report of the Department of Commerce shows that before the war the number of different appliances multiplied by the number of brand names was 680; today that same figure would be 981; also that 238 of the 680 prewar brand-name items are now orphans and that 539 of the present 981 brand-name items are being made by companies who did not make the item before the war. To be financially sound, these plants, both new and old, have to produce in volume and, if the manufacturers don't or can't get sufficient volume through one distribution channel, they'll get it through another.

A request was sent to quite a few of our larger appliance and radio distributors to give me the figures of the increases in the manufacturing capacity of the factories they represented.

Here is the way they came back.

Productive Capacity of Several Factories

in % increase since prewar. Where none made prewar, capacity at present in number of units (in thousands) noted in table by asterisk *

Company	A	B	C	D	E	F	G
Refrigerators	50%		100%	65%	125*		25%
Freezers			400%	100*			50*
Ranges	100%	150%	350%	140%	20*		100%
Water heaters	100%	150%	200%	300%		300%	200%

In the short time available to me, I was not able to get complete information by lines except on laundry

* Presented at annual meeting of Southern California Radio & Electrical Appliance Assn., Feb. 3, 1949.

equipment. In a survey made last year by Les Moffat of *Electrical Merchandising*, 23 laundry equipment factories were covered, and they increased the national production capacity 140% as compared to prewar. Unit sales of laundry equipment, however, have increased only 110%.

Just as long as we have greater national production capacity than we have sales volume to support it, we'll have brand names and a by-passing of the normal distribution channels.

Two theories of distribution seem principally to be followed, both of them successfully. In one case the manufacturer exercises considerable control over the sales policies and activities of his distributors and dealers. This tends toward a smaller number of distributors and dealers, with fewer lines and a higher volume of business from each outlet. In the other case the manufacturer exercises comparatively less control. His distribution is generally through independent distributors and this tends toward a larger number of dealers carrying a larger number of competing lines and a resulting smaller volume of business per dealer on each line. (Particularly radios and traffic appliances)

Now let's look at what has happened in the local wholesale picture since the war. I have only local figures on range and water heater lines and these may not be entirely representative, but:

	Prewar	Number of Makes Postwar	Number of Makes Up	Sales Up
Ranges	13	26	45%	75%
Water Heaters	13	25	90%	30%

The distributors' situation is, in some respects, like that of a dealer; it's true he is exclusive in his territory, but otherwise his situation is similar. He has quotas, margins, a cost of doing business and, whether large or small, factory controlled or independent, whether he handles few lines or many, *his financial success is dependent upon his ability to keep the business volume at his margin high enough to cover his cost of doing business.* He knows his costs, keeps his inventories consistent with his volume and he doesn't sell good-standing merchandise below his total true cost.

Now let's look at the dealer for a few minutes. First of all, he's an individualist. He'd rather be his own boss and own his business, regardless how small, than be part of an industrial giant. When the utilities, manufacturers, or distributors want a specialist in any phase of their operations, they hire the best one they can find; but a dealer has to be his own purchasing agent, sales manager, appraiser, credit manager, service manager, and accountant. And the best accountant in the world couldn't earn his salt as a sales manager; and most of our salesmen couldn't check the circuiting on an automatic washer if their lives depended on it. *So, if a dealer doesn't do all the things we sales managers think he should, let's remember he's running a whole business operation* and he's doing it for *his* benefit—not ours.

Now that we have put ourselves in the other fellow's shoes, let's review again our recent history. Four long years without a single radio or appliance! The theme—take care of 'em, fix 'em up, make 'em last. We sold repair service, china, glassware, records, novelties, garden furniture.

Then came the end of the war and a rush for franchises. Everybody wanted to get in on the killing and a lot of them did. Prewar, there were only 130 major appliance dealers on our lines; today there are over 500. People did everything and everybody, even joined our association in the hope that that would help get them an appliance line. Then two years of allocations—not enough to go around to all the dealers, plead as they might.

But merchandise did start coming—one item after another caught up. We asked the dealers to start increasing their sales expense on items in full supply, but why should they? That would cut into their profit and there were still enough hard-to-get items that didn't require selling. Any one of us would have done the same.

Then came September 1948. In 30 days the customer became king. We'd forgotten in the past years that things might get normal again. We didn't heed the warnings—buy carefully, unload the off-brands and the fill-ins, cut overhead, start rebuilding sales organizations. The manufacturers and distributors started shoving merchandise at us we couldn't turn by the tenth of the month. We got panicky and cut the price; then the customers knew *darn well* that prices were coming down.

The dealers', distributors', and manufacturers' warehouses are all full and we're back to normal—brand names, chain distribution, discount houses, excessive trade-ins, and a little back door selling—1939 returned in 1949. Yet economists, *the nation over*, agree that 1949 will be another high-volume year. The difference? The customer won't buy it from you unless you sell it *and* the service that goes with it.

Space doesn't permit me to mention all the problems some of you dealers and distributors raised when I was preparing this talk, but I must mention a few:

Increased Margins: The customer pays a premium on manufacturing costs to have a given item delivered in perfect operating condition, and when that premium exceeds the value of the service given, you've lost a sale. If your competitor can deliver the same item and give *seemingly* the same service at a lower price, you'd better improve your selling *and* your service, *and* your cost of doing business.

Distributors have a margin too, and for that they perform a useful service; but I can't help calling attention to the fact that while their dealers are their customers, the dealers are in effect only way stations on the road to the ultimate consumer. Many of the distributors' salesmen are new men; they are usually paid a fixed salary, plus commission; they are fired up by very excellent sales managers to make sales, and thus tend to forget that *a dealer can buy only as much as he sells at a profit.* We now need more dealer counselors and fewer wholesale salesmen.

Know your Costs: This has been said many, many times and could be said many more. The trouble is we think we know them when we really don't. Several years before the war I bought several items from an independent dealer on the west side of town. One day he said, "Had a pretty good month last month; made $175." "Good! How much did you take out for your salary?" "Nothing; that was my salary." "How much did you take out for interest on the money you have invested?" "Nothing; you don't figure that way." Today he's behind a bench as a serviceman.

You may have $25,000 of your own money invested in your business. Are you charging yourself interest on that money? You wouldn't loan that much to anyone else without collecting interest on it. Why loan it to yourself for free?

The other day two dealers were talking; one dealer told the other he had cleared 12%. "Oh, ya! How much did you take out for you and your wife's salaries?" "$350." He couldn't have hired a man to do his job for less than $500, plus another $250 a month for a girl to do the job his wife was doing. When all costs were charged, he was making less than 5%. One of the saddest pictures the bankers have to deal with

is the man who finds out too late that he is slowly going broke.

Too Many Dealers: When every dealer has five lines, any one distributor can only get 1/5 of each dealer's business; so the distributor has to have five times as many dealers as if he had all of one dealer's business. When one outlet in a given area will give a distributor as much volume as five, the distributor will cut out the other four, because it costs him more to handle five accounts than one. But, so long as the dealer's competitors in any given area have a large number of lines, he also has to have a large number to compete with them, so he won't cut lines until the distributor cuts the number of outlets. So we just keep on going round and round, getting nowhere.

Sales Activities: A lot of you dealers have said you're not interested in sales campaigns. I don't believe it and I don't think you do either. Things happen when we all go in the same direction at the same time. There is hardly a firm represented here that didn't make a nice piece of change on the electric bedding campaign this year. There's one thing I *can't* see though, and that is the firm that takes everything it can get *out* of the industry but never puts anything *back*.

Now, I'd hardly be completing my assignment if I didn't suggest some definite points of attack on our problems. So, here's a three-point program that I offer for your consideration:

1. Let the men in the industry run the business of the industry through a greatly expanded working committee organization. Then more people *in* our industry will know what is being done *for* our industry because they will have helped *do* it.

2. Sponsor frequent "radio and appliance town hall" meetings, both centrally located and by districts, where the problems and important activities of our industry could be presented and discussed by *all branches* of our industry more completely than we have had time to do here.

3. Set up a small business advisory council composed of qualified advisors on all phases of business management to whom a dealer, or any other member of the industry, could go in strictest confidence for review of the condition of his business, and obtain free counsel and advice as to its operation. This council would be charged with a development of a cost-consciousness on the part of the dealer group so that they will go after the deals they *make* money on and have fortitude enough to turn *down* the deals they *lose* money on.

Now let's review:

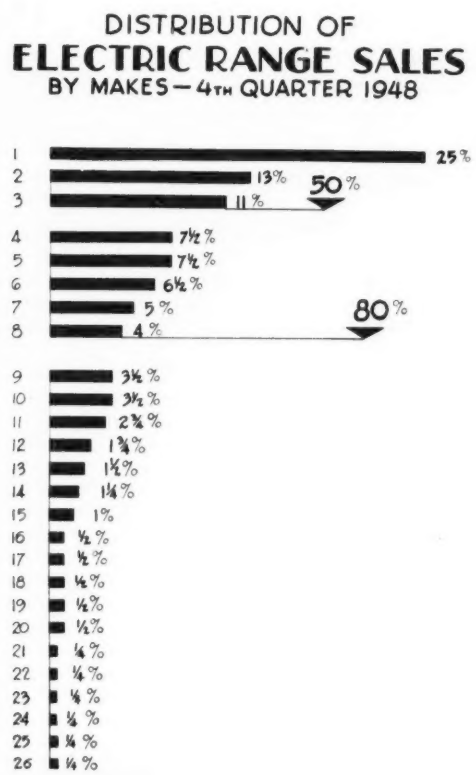
1. We are still in America, and democracy still works.

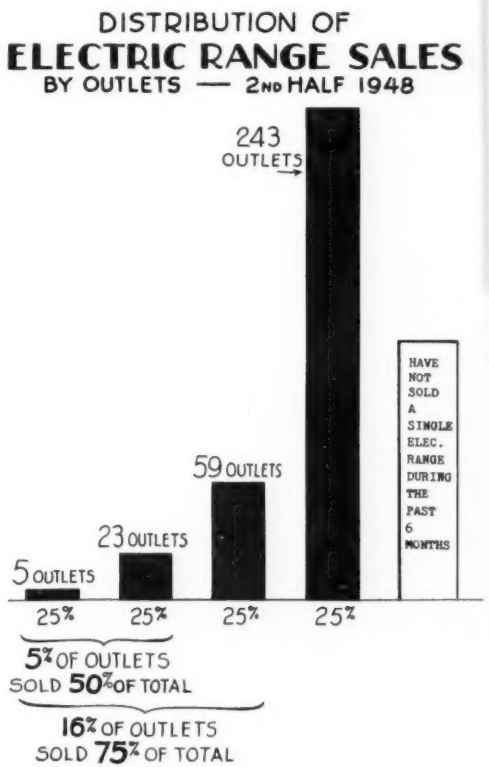
2. The managers of our businesses are human beings doing the best job they can with the knowledge and ability they have.

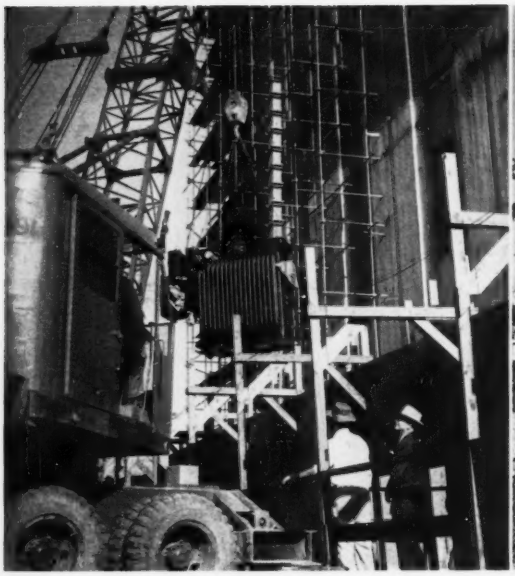
3. Most of us have done as much to pull our industry down as we have to lift it up.

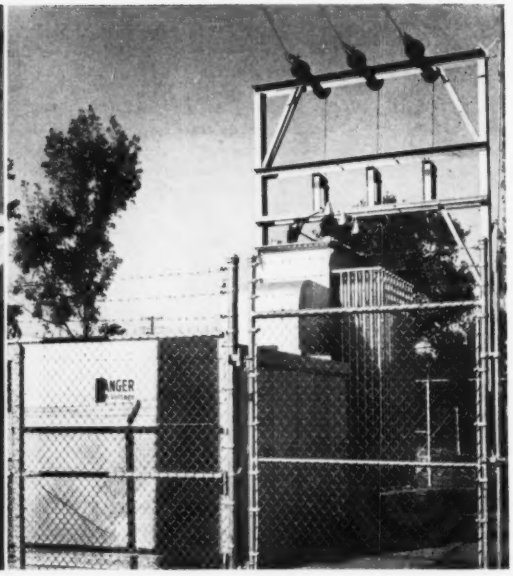
4. What we do for ourselves individually is worth a lot more than what the other fellow does for us.

5. We're not all going to hell in a hand basket. Every obstacle is a challenge and an opportunity. Tomorrow will be only as good as we make it.




DISTRIBUTION OF
ELECTRIC RANGE SALES
BY OUTLETS — 2ND HALF 1948
243 OUTLETS
59 OUTLETS
23 OUTLETS
5 OUTLETS
HAVE NOT SOLD A SINGLE ELEC. RANGE DURING THE PAST 6 MONTHS
25% 25% 25% 25%
5% OF OUTLETS SOLD 50% OF TOTAL
16% OF OUTLETS SOLD 75% OF TOTAL



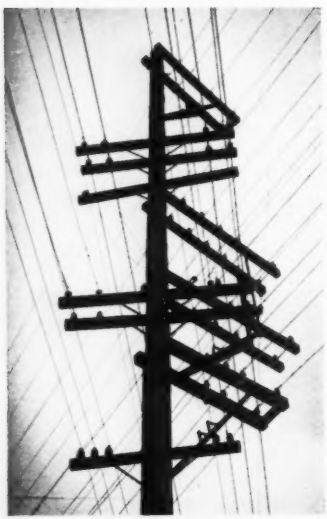


500-kva. network transformer (left) for Sacramento's new a-c underground. Primary feed will be 12 kv.—secondary will be 120/208-volt network. Unit substations (right) located on small lots are interspaced on existing primary to handle greatly increased loads in long-range program. Poles like that shown below may be a thing of beauty to oldtimers but they have no place in tomorrow's picture. Today's planning calls for greatly improved appearance

System Planning for Tomorrow's Loads

Paul E. Shaad

Chief Electrical Engineer
Sacramento Municipal Utility District
Sacramento, Calif.

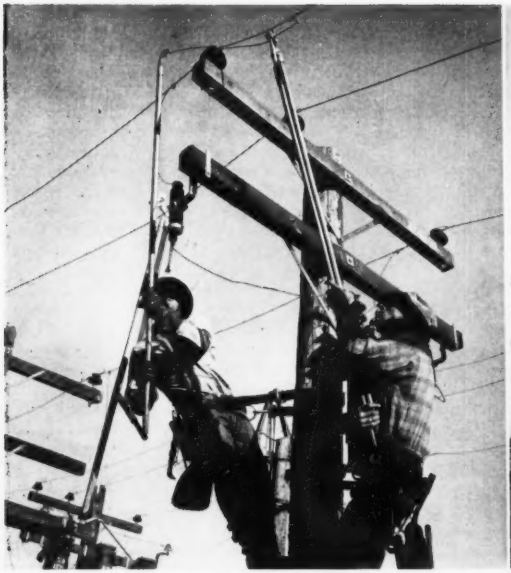


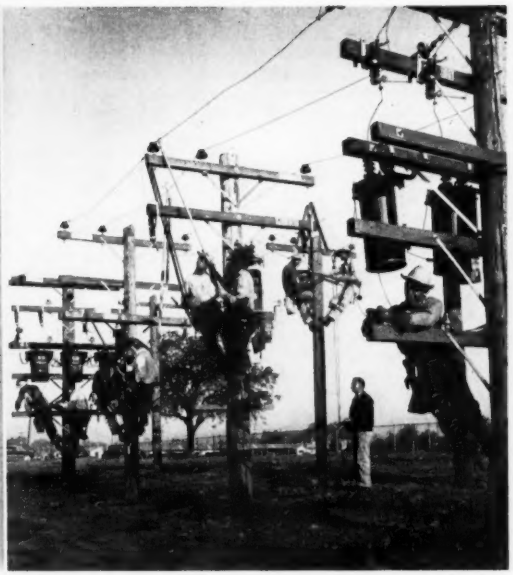
YESTERDAY'S distribution problem was simply one of expanding a system that was presumably conceived to be economical and capable of meeting extended growth. Today however that system, as it was then conceived, has been extended to its limits and is loaded. Today's problem is one of altering that system, or of starting a new system, or both, in order to meet tomorrow's growing load. In drawing up such plans certain principles stand out clearly.

First, the existing serviceable plant must receive prime consideration. Widespread premature retirement can seldom, if ever, be justified. On the other hand, system plans must grasp every opportunity to modernize where retirements are necessary and some hastening of plant retirement may be entirely justified in the face of a rapidly growing load. Second, the new plan must maintain voltage regulation within recognized acceptable limits. Voltage drop limits assumed and the apportionment of this voltage drop to the various components of the distribution system are matters of great importance. The system designer must be fully acquainted with the economics of this important phase of his problem.

In addition, the new plans should lead toward increased reliability. Exactly how much money can be allotted to this element is a matter for the exercise of good judgment. Good outage records are a valuable tool in formulating such judgment. Then, too, the plan must be flexible in the extreme. It must not call for tying up large investments in anticipation of loads which may not develop. At the same time, the system plan must be ready to cope with loads perhaps totally unanticipated and to do so economically.

Not to be overlooked is the matter of good appearance of the overhead plant which may constitute the new system many years from today. A 60-ft. class III corner pole with subtransmis-





Linemen's training school is important part of Sacramento program to assure manpower for hot-line work in changing over from 4-kv. to 12-kv. distribution

sion on top, several trunk feeders below, followed by the usual array of primary, secondary, street light circuits, fire alarm circuits, and telephone, may be a thing of beauty to some old timers but others do not share this sense of appreciation. Such overhead plant, of which much exists today, is not only unslightly but is also very costly to maintain. It has no place in tomorrow's picture. The new plan should strive toward simplified construction. One primary circuit, one secondary circuit and, where necessary, one subtransmission circuit would constitute the maximum distribution occupancy of any pole. Both primary and subtransmission would be carried on crossarms of minimum length. Secondary would be on racks wherever possible.

Application of these principles by the system planners of today has brought forth all sorts of results depending on existing conditions and on the weight given to various elements. Of particular interest are two unmistakable trends. One is toward meeting load growth through the addition of relatively small factory-built unit-type substations interspaced on existing primary circuits. The other is toward the conversion of existing 2,300- or 4,160-volt distribution plant to higher voltage in the 12,000- or 13,200-volt class.

As related hereafter it will be seen that both of these trends have found a place in system plans very recently formulated for the Sacramento Municipal Utility District. This district is the sole electric distribution agency for 650 square miles of urban and rural territory surrounding and including the city of Sacramento. The area has a population of 250,000. There are 78,000 customers. The demand has exceeded 85,000 kw. It is expected that this demand may double in ten years and system plans have been laved accordingly.

The present system is a composite of distribution utilizing 2,300-, 4,160-, 4,300-, and 12,000-volt distribution in varying amounts and 12-kv., 22-kv., and 60-kv. subtransmission. An additional complicating factor is a 30° phase displacement between parts of the system. The dense and rapidly growing downtown commercial load is fed underground by 4-kv. radial primaries and 120/208-volt 4-wire star radial secondaries.

Since 12,000-volt distribution is already in considerable use in rural areas and since studies indicate marked economies for 12,000-volt distribution in such areas, all new construction in rural areas will be trimmed and insulated for 12 kv. A program for conversion to high-voltage distribution is now underway. This 12-kv. distribution will approach close to the urban areas and will be counted upon to take a good share of the district's load growth outside of the urban area proper. Much of this distribution is joint with the telephone company. No problems of any magnitude have occurred in the first 18 months of this conversion program.

Nominal 33, 66, and 110 kv. were studied as subtransmission voltages to supply this large 12-kv. distribution area. These studies showed 66 kv. to be most economical without a doubt. Accordingly, rural subtransmission will be built for 66 kv. but will operate, at least for the present, at 60 kv. of which there is now a satisfactory source.

Relatively small 66/12-kv. substations, that is, 2,000 or 3,000 kva., of the factory-built single-circuit type will be added as loads develop. Careful attention will be given feeder protection using pole-top-mounted reclosers combined with a program of fuse coordination to give maximum service continuity over the relatively long radial feeders. Reactive will be supplied by static capacitors on the feeders to maintain an average power factor of 90% or better. In the urban area 4,160-volt distribution will continue. It could not be otherwise because of the very considerable investment in 4,160-volt plant within the urban area. The 2,300-volt feeders will be cut to 4,160 volts as time permits and as loads make this necessary.

Although 34.5 kv. would undoubtedly be the most economical subtransmission for this urban area, 22 kv. is in extensive use and must be continued. A study showed that substation supply capacity could be added to the existing primaries in the most economical manner by the periodic addition of small single-circuit self-contained 22/4-kv. unit substations. Such sub-

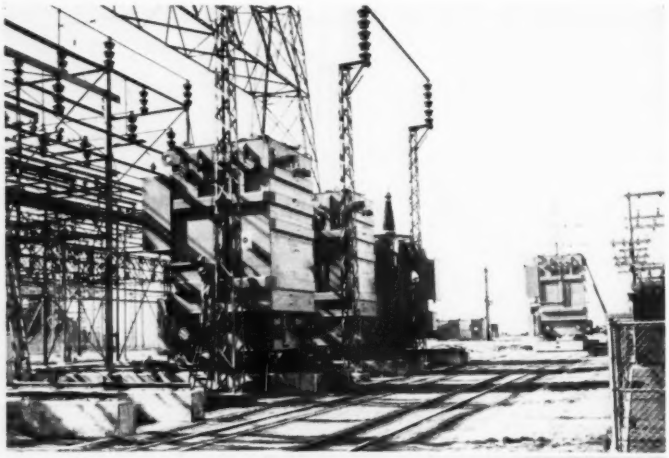
stations rated 1,500 or 2,000 kva. can be located on very small pieces of property. This makes much easier the task of locating them where loads require, adjacent to suitable existing primary circuits and readily accessible to subtransmission.

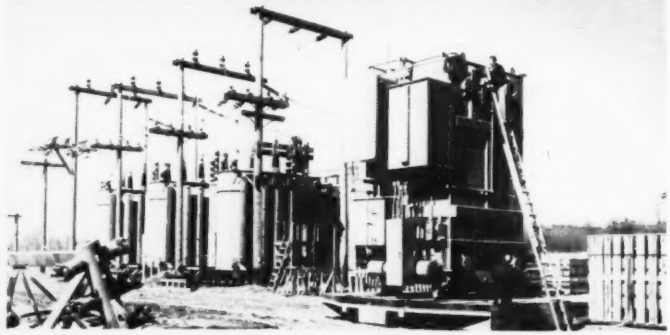
Any new primary feeders will be No. 2/0. New distribution secondaries are No. 2 copper hot legs with the perfectly satisfactory No. 4 copper neutral. Minimum size residential service drop is set as No. 6 copper. Distribution transformers will be worked to 133% of nameplate rating. As in the rural area, a study has shown it to be economical to supply reactive up to 90% average power factor or better by static capacitors on the feeders. Serious consideration is being given to use of the recently announced secondary capacitor to supply a portion of the reactive by static capacitors right on the secondary itself. Regulation on the 22-kv. subtransmission will be maintained within 3% so that spot industrial loads can be taken direct from subtransmission without the use of voltage regulators.

In the underground, a quick survey showed trouble ahead if the practice were continued of taking added load on the underground system by means of additional 4-kv. feeders. A complete study of the underground distribution system was necessary. Numerous factors were found to be in favor of a secondary network system. Since both 22 kv. and 12 kv. were available adjacent to the underground area, both were studied as a possible feed to a secondary network system; 12 kv. was found to be somewhat the more economical. The first steps have accordingly been taken toward establishing a 12-kv. fed secondary underground network and all major loads added in the underground area will be taken on that system; 12-kv. feeders will be No. 4/0 paper and lead and will be loaded to 6,000 kva. under conditions of one feeder out. Standard 500-kva. network units will be used located in sidewalk vaults of minimum dimensions. Secondaries will be 250 mcm rubber and neoprene.

The street lighting system has been one of the last items to come up for study. Great activity in street lighting is anticipated at an early date. The present street lighting plant is a 6.6-amp. series system. Spot additions to this system have proved to be very costly. This is primarily because of the high cost of conductor rearrangements often necessary in connection with the addition or change in location of single street light units. Since multiple street lighting, using individual photoelectric-controlled relays, would not have this inherent disadvantage, it has been given considerable study. Its economy is assured if operating costs and maintenance of individual photoelectric relays is reasonable. Present plans call for the determination of this operating and maintenance cost by actual trial of a rather large installation of such units.

It is firmly believed that the capital investment required for expansion of the present distribution system may be reduced substantially and that, at the same time, a better system will result through the continued use of good long-term system planning. An additional 5% or 10% saving will be sought in simplification of construction standards and in the use of conductor materials other than copper.



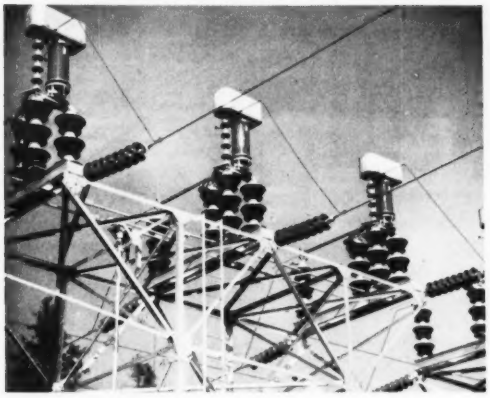


More Power for Portland Area

TROUTDALE substations built by the Bonneville Power Administration to serve a four-pot-line aluminum reduction plant near Portland is presently undergoing expansion to give the two Portland private utilities a new BPA connection and an additional power supply. The accompanying photographs show units of a new Westinghouse transformer bank being installed. These transformers are similar to a bank installed at BPA's Snohomish substation last year. They are of the shell-form, form-fit type, triple rated at bank capacities of 150,000 kva., self cooled; 200,000 kva., with fans; and 250,000 kva. with both fans and forced-oil cooling. Transformers of this type are shipped on their side completely assembled except for bushings and radiators, and then uprighted.

The Troutdale bank will step down from two 230-kv. BPA lines to 57 kv. to serve lines of Portland General Electric Co., and 13.8 kv. to serve pot lines at the aluminum reduction plant now operated by Reynolds Metals Co. An old bank of three 25,000-kva. transformers, 230/66/13.8 kv., feeds lines of the Pacific Power & Light Co. at 66 kv., and one pot line at 13.8 kv.

Net result will be another 25,000 kw. for aluminum; more capacity for the two utilities serving Portland.



Interrupter Switch Protects Transformer

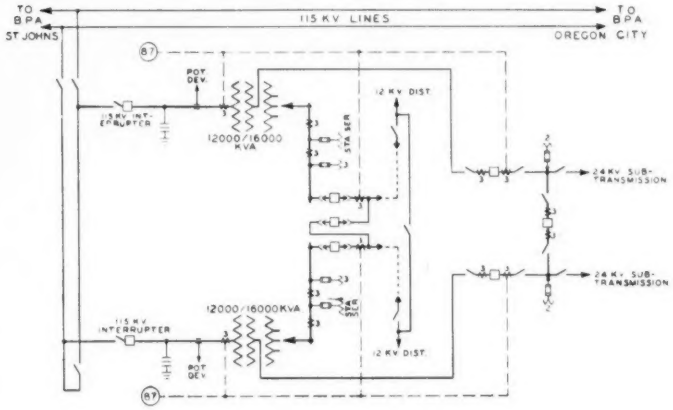
John Bankus
Chief Engineer
Portland General Electric Co.

UTILITY engineers have long felt the need for a high-voltage interrupting device for high-side protection of step-down power transformer banks that would afford more adequate protection than fuses; which would prove more economical than the ordinary oil circuit breaker, and at the same time offer the possibility of applying conventional relay protection. An interrupter switch meeting these requirements was recently installed at the St. Mary's substation of Portland General Electric Co. This substation contains two 12,000/16,000-kva., 115/24/12.5-kv. 3-phase transformer banks. Transformers are arranged for connection to either of two 115-kv. lines and supply two 24-kv. subtransmission and two 12.5-kv. distribution circuits with connections as shown by the accompanying diagram.

The 115-kv. connections for these two transformer banks include two 115-kv. interrupter switches manufactured by the Schwager-Wood Corp. of Portland, Ore. This interrupter switch consists essentially of an air break switch upon whose hinge end is mounted a small interrupting chamber containing an oil-blast-type interrupter, as shown by the accompanying photographs. The interrupting device is in series with the air break switch, and upon opening of the air break switch, interrupts the current prior to the separation of the air break contacts. The tripping coil is energized from a 48-volt battery. Closing of the interrupter switch is performed by a manual control handle on the operating mechanism as shown. The closing stroke of the disconnect operating handle compresses the opening spring on the disconnect control mechanism and also the opening springs in the oil blast interrupter.

The interrupter switches have an interrupting capacity rating of 250,000 kva. and are connected so as to provide differential protection for the two 12,000/16,000-kva. transformer banks. The 115-kv. current transformers are of the bushing type and are mounted on the high-tension transformer bushings. Opening time of the switches from the instant the trip coil is energized to the time of arc interruption amounts to 20 cycles. This opening time combined with relay time will clear short circuits up to 250,000 kva. For higher values of short-circuit currents such as might occur with a dead short in the high-tension transformer winding, the back-up breakers protecting the 115-kv. supply lines will open prior to the time that the interrupter switches will be called upon to interrupt. In addition to providing better transformer protection than can be obtained with fuses, the load break disconnects have the ability to interrupt the load current and also the transformer exciting current.

Prior to this installation, extensive tests were made by the Bonneville Power Administration at its Oregon City substation on interrupter switches made by three different manufacturers. So far as is known, the St. Mary's interrupter switches are the first actual installation of this type of equipment in the Northwest.



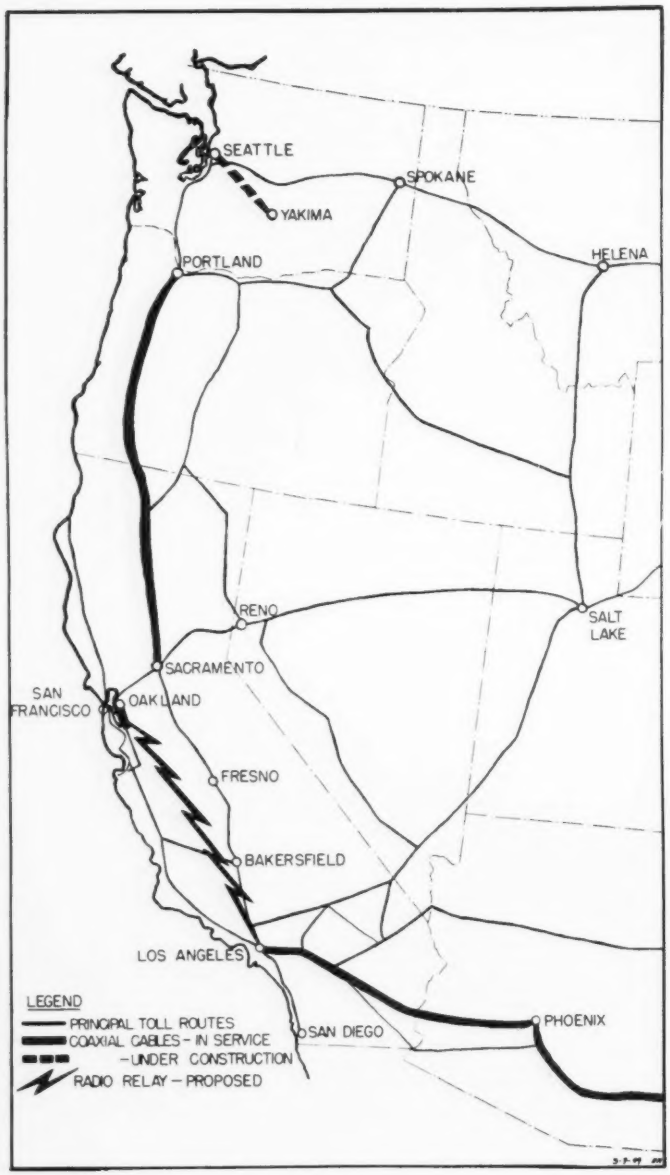
ST MARY'S SUBSTATION

Round tanks shown contain oil-blast interrupter switches that will interrupt 250,000 kva. at 115 kv. When air-break disconnecting switch is operated, interrupter mechanism is actuated to open circuit before air-break contacts open

Single-line diagram of Portland General Electric Co.'s St. Marys substation showing installation of two 115-kv. interrupter switches for primary protection of 16,000-kva. transformers

Coaxial Cable and Microwave Channels Projected For West Coast

D. I. Cone
Pacific Telephone & Telegraph Co.,
San Francisco



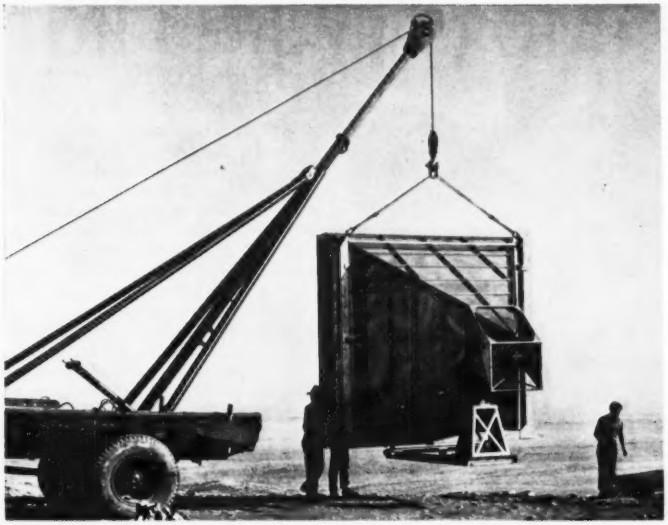
Coastwise network of P. T. & T. Co., showing existing and projected facilities for television network service as well as telephone message service

COAXIAL cables and microwave relay links on certain backbone routes are included in the large postwar expansion program of the Pacific Telephone & Telegraph Co. These will provide facilities for hundreds of additional long distance telephone and telegraph circuits when needed to meet the increased communication requirements of the Pacific Coast. Also, these new facilities may be equipped for television signal transmission should demand arise. Hence, they may be utilized to furnish television channels between principal cities of the Coast, and ultimately to become part of a nationwide network for television programs.

The first of these wide-band systems in the Far West was the eight-coaxial cable via Dallas, El Paso and Phoenix into Los Angeles, completed in November 1947. At that time, one pair of coaxials was placed in service and now provides 600 broad-band message telephone circuits. One coaxial carries the signals in one direction and another in the opposite direction. Two more of the coaxials are equipped to protect the service. The remaining four coaxials will be used in the near future for telephone message service.

A coaxial cable from Sacramento to Portland, was placed in service late in June 1948, providing eight coaxials most of the distance. Four coaxials in this cable are now equipped in the same manner as the Los Angeles-East cable and help to carry the heavy telephone traffic to the Pacific Northwest that developed during and after the war. A Seattle-Yakima cable of four coaxials is in process of construction, for service in 1950. Present plans include the construction of radio relay systems between San Francisco and Sacramento and between Portland and Seattle for service in 1951. These facilities are primarily for telephone service but may be equipped for television service, provided a demand should develop.

The coaxials contained in these cables are copper tubes $\frac{3}{8}$ in. in diameter with a No. 10 AWG copper wire at the axis of each tube, held in place by polyethylene insulators about one inch apart. When equipped with amplifiers, at about eight-mile intervals, together with the appropriate terminal and regulating equipment, one pair of coaxials is capable of handling as many as 600 telephone messages, or two tele-



Metallic lens antenna of a type similar to those to be used in the Los Angeles-San Francisco microwave relay link, being placed for testing transmission

vision channels. Quadded conductors are also included in the cable to serve intermediate short-haul points.

Successful culmination of experiments in wide-band transmission by means of microwave relay circuits between New York and Boston, publicly demonstrated in November 1947, has led the way to further application of microwave radio relay equipment for telephone and television transmission. Field tests of radio transmission paths in the 4,000-megacycle super-high frequency range have been made in California during the past several months on the route between Los Angeles and San Francisco. These have resulted in application to the Federal Communications Commission for construction permits covering a path along the west side of the San Joaquin Valley.

This project will be the first step in providing telephone message channels between Los Angeles and San Francisco through the use of radio relay equipment. This system will also carry television images and by late this year or early in 1950 will provide one one-way television channel from Los Angeles to San Francisco. It is planned later to provide telephone and additional television facilities and it is expected that the system will ultimately be capable of transmitting hundreds of long-distance calls simultaneously, as well as the sight and sound waves of television broadcasts.

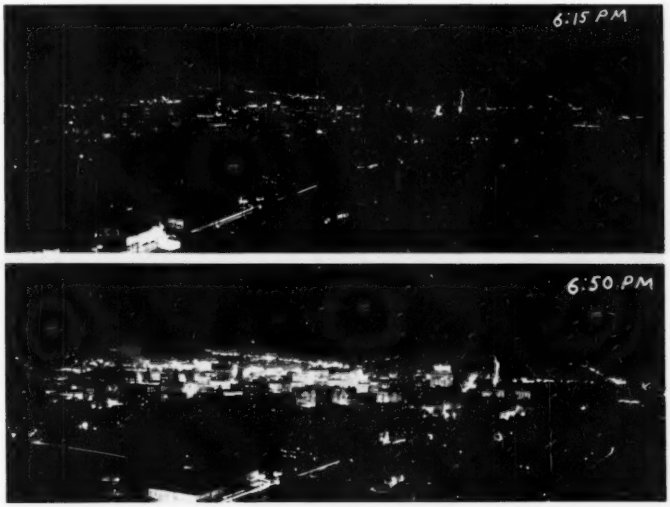
This system will operate in the band between 3,700 and 4,200 megacycles, designated for point-to-point service, using transmitters of about 2-watt output and highly directional metallic lens antennas, developed by Bell Telephone Laboratories. When fully equipped, it will have capacity of six radio channels in each direction. Initially, there will be nine intermediate repeater points. Construction of the relay stations will start as soon as FCC approval is received.

In addition to the arrangements for intercity television transmission as above described, studio-to-transmitter and local pick-up links have been set up connecting Hollywood to Mt. Wilson, and serving certain Los Angeles television stations. For this type of service, besides microwave radio equipment, special cable pairs having polyethylene string wound insulation are available in some of the newer urban cable runs. Ordinary cable pairs with video-amplifiers may also be used for short runs.

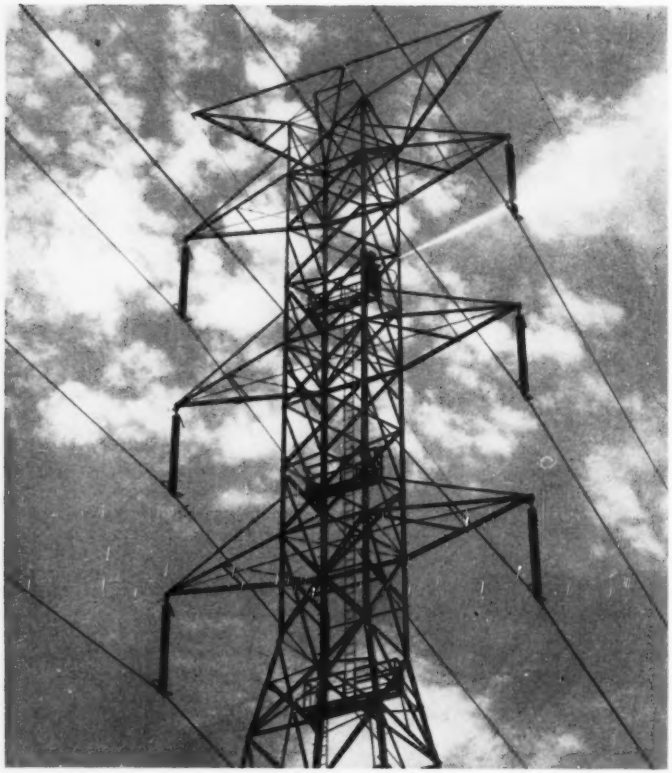
By these means and by continuing studies of other possible requirements, Pacific Telephone is undertaking to meet the needs of television broadcasters on the West Coast in a manner comparable to the providing of circuits for sound broadcast.

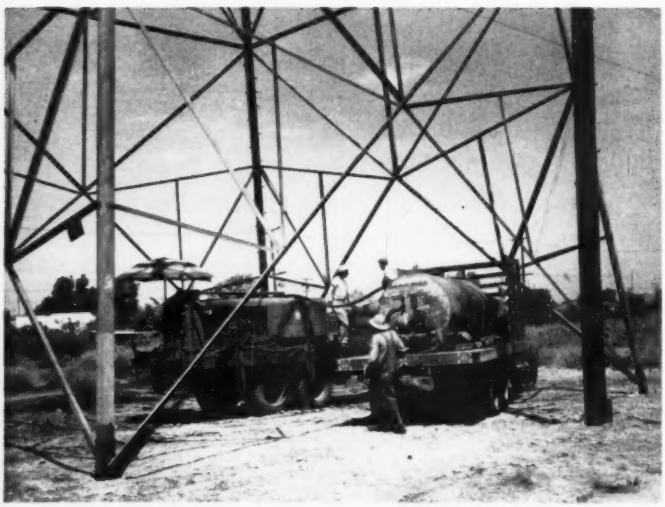
Results of Power Curtailment

The accompanying photographs strikingly show the reduction in general lighting obtained in Portland by pleas of the utilities for curtailment over the evening peak during the past winter's power shortage in the Pacific Northwest. Upper view was taken at 6:15 p.m., and shows a very marked reduction in general illumination over the city as compared with the lower picture taken from the same spot at 6:50 p.m., or 20 minutes after the 4:30 to 6:30 p.m. peak period had passed. Peaking deficiency estimated to have been 250,000 kw. was met by cooperation of all power agencies and voluntary curtailment by the general public.



287-KV. INSULATORS WASHED HOT





FOLLOWING many years of successful washing of insulators on energized lines, Los Angeles Department of Water & Power is now washing insulators on the section of its 287.5-kv. Hoover Dam-Los Angeles transmission lines that traverses the dust and fog area adjacent to Los Angeles as a regular maintenance practice. The accompanying photographs, taken by M. M. Phegley of the department, show the washing operation.

The truck-mounted high-pressure pump unit shown has a capacity of 50 gal. per minute at 1,000 psi. At this pressure, with a special nozzle developed by the department, with proper grounding and other safety precautions, and with water of a minimum restivity of 1,000 ohms per centimeter cubed, the washing is carried out with entire safety. Where local water must be purchased, resistance is measured with a special portable instrument to check its suitability and thus take no chance of a flashover.

The 500-gal. pump-truck is kept supplied with water by a 1,200-gal. tank truck hauling water from a hydrant or other suitable source. Double-circuit suspension towers with 24-unit insulator string require about 800 gal. of water; dead-end towers take approximately 1,500 gal.

Technique in washing is to start with the lower insulator of a string and proceed upward. If washed from top to bottom, the water falling over dirty lower insulators might cause flashover. For convenience and to save hoisting a long length of high-pressure hose up a 225-ft. tower, most of the towers in the Los Angeles fog and dust contamination area are permanently piped with copper pipe. Washing in this area is required about every six months. The washing crew consists of foreman, two linemen, two assistants and a driver for each of the two trucks.

The same equipment and procedure is used also on 138-kv. lines. For 34 kv. and lower voltage circuits within the city, hot-line insulator washing has been carried on for many years with two pieces of equipment; a hydraulic lift nozzle platform truck, and a standard fire apparatus ladder truck.

Washing insulators with high-pressure water stream on 287.5-kv. energized lines (above). Pump-truck unit (lower) supplies 50 gal. of water per minute at 1,000 psi. to pipe running up tower. Tank-truck at right is the water carrier

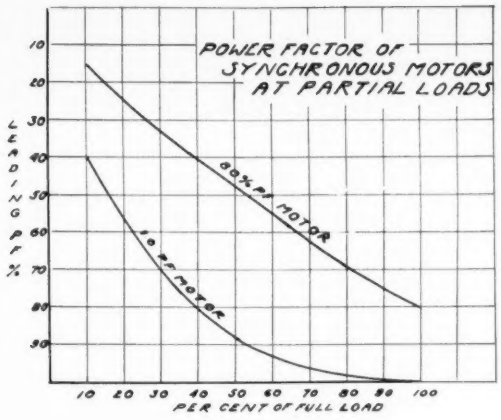

POWER FACTOR OF SYNCHRONOUS MOTORS AT PARTIAL LOADS
LEADING PF %
80% PF MOTOR
1.0 PF MOTOR
10 20 30 40 50 60 70 80 90 100
PER CENT OF FULL LOAD

Fig. 1

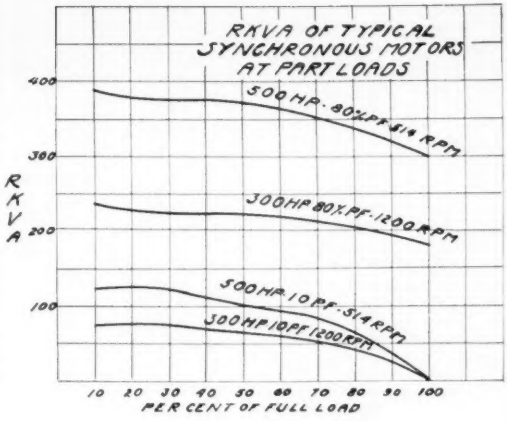

RKVA OF TYPICAL SYNCHRONOUS MOTORS AT PART LOADS
RKVA
400
300
200
100
500 HP. 80% PF 514 RPM
300 HP 80% PF 1200 RPM
500 HP. 1.0 PF 514 RPM
300 HP 1.0 PF 1200 RPM
10 20 30 40 50 60 70 80 90 100
PER CENT OF FULL LOAD

Fig. 2

Low Power Factor in Industrial Plants—

and what to do about it

W. C. King
Los Angeles

VI. How much correction do we get by running a synchronous motor at part load?

A quite common fallacy is the belief that a synchronous motor will supply several times as much power factor correction at part load as it will at full load. It is, of course, true that, as the load decreases, the motor operates further and further leading. But our kw. input is also going down so we find that our over-all gain in correction is not anything startling.

Example:
300 hp., 1.200 r.p.m., 1.0 PF motor at half load:

$$\text{Kw. input} = \frac{\text{hp. load} \times .746}{\text{eff.}} = \frac{150 \times .746}{.917} = 121.8$$

From Fig. 1, PF at half load is 88%.
The rkva. factor for 88% is .540
Then rkva. = .540 x 121.8
rkva. = 65.8

If we figure out the rkva at 10% load, we find that it is 73.3; not much of an increase.

It is apparent from the shape of the 80% PF curve that we are going to get considerably more correction at part loads than the unity PF motor gave us.

For comparison, let's take an 80% PF motor of the same hp. and speed as we used above:

$$\text{Kw. input} = \frac{150 \times .746}{.903} = 124.0$$

From Fig. 1, PF at half load is 48%, for which the rkva. factor is 1.828.
Then rkva. = 1.828 x 124.0
rkva. = 226.5

At full load the rkva. is 181.0; by running at half load we have increased our correction by 45.5 rkva.

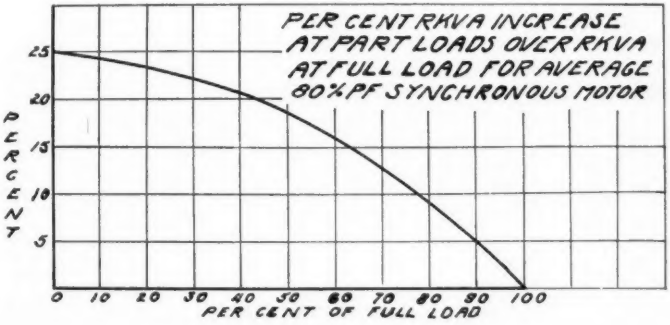
A couple of typical ratings were selected and the rkva. calculated from full load down to 10% load. Fig. 2 shows the results of these calculations.

Fig. 3 may be used to arrive at the approximate amount of correction obtained at any load on an 80% PF motor.

Example:
What correction will we get from a 500-hp., 514-r.p.m. motor at ¼ load? Looking up the efficiency of this machine, we determine the rkva. at full load to be 300.
From Fig. 3 we find that the increase at 25% load is about 23%. This amounts to 69. Then rkva. at ¼ load is 369.

The next article will discuss the case of the high-torque mill-type motor.

Fig. 3


PER CENT RKVA INCREASE AT PART LOADS OVER RKVA AT FULL LOAD FOR AVERAGE 80% PF SYNCHRONOUS MOTOR
PERCENT
25
20
15
10
5
0 10 20 30 40 50 60 70 80 90 100
PER CENT OF FULL LOAD

Lighting of Macy's new San Francisco store called for good intensity and even distribution with no suspended fixtures from ceilings. This first floor view shows the six-lamp recessed louvered fixture used. Intensity is 30 f-c

Electrical Features of Macy's New Store

L. G. Dehrer

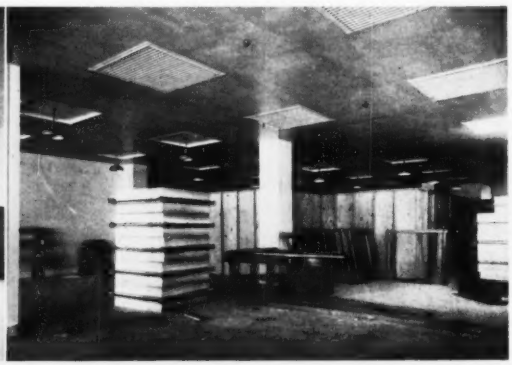
Clyde E. Bentley, San Francisco

SEVERAL features of the lighting and power wiring and a new type of fluorescent lighting fixture characterize Macy's new department store in San Francisco. The new store is made up of two parts, an existing nine-story building and a matching eight-story addition with combined floor area of 445,000 sq. ft.

The electrical designer faced many problems. Principal of these was completely revising the electrical installation in the existing building for adequacy and flexibility. Vertical riser shafts with bus duct feeders were constructed and branch circuit wiring was changed to new panelboards. All work had to be done with the store in normal operation, making the job doubly difficult.

In designing the electrical system for the new store, three points were adhered to, namely, adequate feeder capacity, adequate branch circuit ca-

Recessed 100-watt spots on 7-ft. centers (left) used on two floors. This view of an unfinished floor shows a very even distribution of light at floor level. This type of lighting was chosen especially for furniture department. Right: In stock areas shallow metal pan fills ceiling recesses and RLM units are used



Fourth floor lighting (left) is typical of upper floors. Here four lamps were used in the recessed fixture to provide 20 f-c maintained. View at right shows the attractive men's shop with cove, spots and other special effects

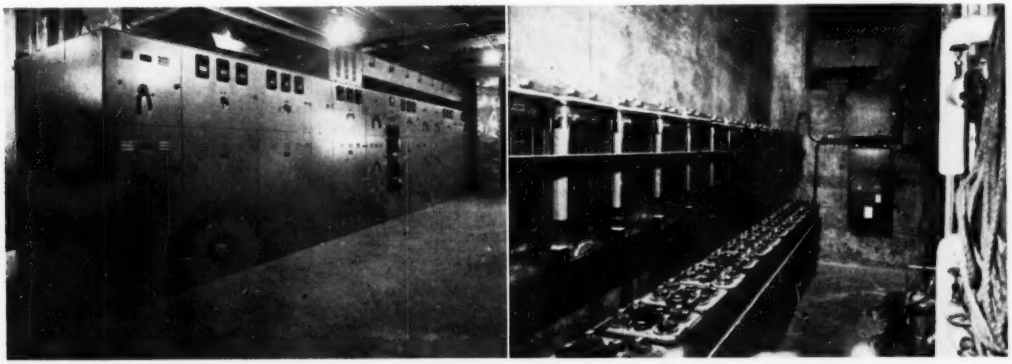
pacity and flexibility of power distribution. The possibility of future floors also had to be considered. To meet these requirements a Trumbull Electric Co. low-reactance bus duct riser system was installed. Four bus risers were provided vertically through the building. A fifth riser was provided for certain parts of the basement, first floor and show window areas. Bus risers were located as close as possible to load centers of load areas to be served. Bus duct capacity was figured on the basis of seven watts per square foot of floor space. Panelboards located in closets on the various floors have circuit capacity to provide two 15-amp. circuits for each 21x21-ft. bay area. One circuit is utilized for overhead lighting and the other for show cases and miscellaneous lighting. Show cases in the new building are served from underfloor duct. Provision was made for increasing panelboard capacity if occasion should arise.

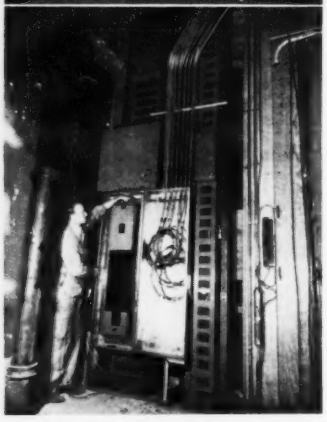
Initial power required for the store, based on a fluorescent lighting layout, indicates that an average of four watts per square foot will be required for overhead, show case and accentuated lighting. Loads may shift as between floors due to shifting of departments or rearrangements, yet flexibility of the feeder system will permit of these changes without imposing a greater load on the switchgear in the subbasement.

Main Switchboard

The main switchboard was designed around the possibility of future load increases. Service into the gear is adequate to handle 100% of all branch feeders. Switchgear is of the draw-out type for flexibility and ease of maintenance. The entire switchboard supplied by the General Electric Co., is an assembly of air circuit breakers properly cascaded. Two lighting services and one power service are provided from the Pacific Gas and Electric Co.'s network at 120/208 volts. Each lighting service consists of a 4,000-amp., 3-phase, 4-wire, low-reactance bus duct. The power service, because of its proximity to the vault, consists of a single 4,000-amp., 3-phase conventional bus duct. The 4,000-amp. air breakers are provided with induction relay tripping and an ammeter switch. A common ammeter is provided to determine phase loading of any of the three feeders. Current transformers

Main switchboard was provided with induction-type over-current relays, ammeter for checking feeder and phase loads, and ample spare future capacity. Storage battery for emergency lighting (right) will carry stairwells, toilets, exits and a general glow of lighting throughout the entire store for an hour





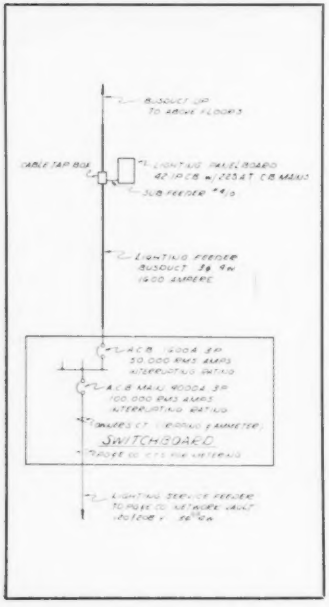


Diagram of single lighting feeder showing method of cascading air breakers

normally required for tripping were also wired to the ammeter switches. PG and E metering is by means of wiring the secondaries of the current transformers, provided by them, in parallel and thence to a common watt-hour meter. Current transformers were installed on the line side of the main air breakers in this case. Subfeed air circuit breakers were provided from the load side of the 4,000-amp. mains and properly cascaded from 1,000 to 2,000 amp. to supply the various power and lighting bus duct feeders within the building.

Power Distribution

Power was supplied to the existing building at 480 volts three phase. Therefore, engineers were faced with the problem of converting the existing motors over to 208 volts or of providing step-up from 208 to 480 volts. From an economical and practical standpoint, it was decided to install a bank of three 200-kva. transformers to supply 480 volts for power. Eleven 50-hp. elevator motors, as well as four 50-hp. air conditioning units with their fan equipment on the roof, was the deciding factor. However, all new motors such as those for ventilation, escalators, and mechanical equipment were served directly from the 208-volt network service. This helped to hold down the size of the 480-volt step-up transformer bank.

Emergency Lighting System

Provision was made for emergency lighting for all stairwells, general sales areas, toilets and certain subbasement areas. The 120-volt d-c Exide battery emergency system is entirely automatic immediately upon power failure. Within the general sales area some ten 100-watt lighting units have been provided on each floor, which will offer a glow during a power failure to discourage shoplifting and help in evacuating the building if need be. The trickle-charged battery is of capacity to provide rated voltage for one hour duration.

Low reactance feeder bus duct was used throughout for light and power distribution. Vertical duct runs are amply supported by angle irons as shown above which run the height of building. A major electrical problem was completely rewiring existing building with the store in normal operation. Lower view shows one of the new panelboards, feeder bus risers and, at the right, wooden timbers used for mounting telephone cable and terminal strips

Lighting

Prime consideration of the owners in lighting the store was to provide a ceiling devoid of suspended fixtures. A general level of 30 f-c maintained was desired for the first floor and 20 f-c in the basement sales area and on the 2nd through 5th floors. To accomplish this a 4x4-ft. louvered fluorescent unit was developed for mounting in the furred ceiling with the louver flush with the ceiling. Six 40-watt lamps are used in the 1st floor fixtures and four lamps in the others. Four fixtures are installed within a 21x21-ft. bay leaving a blank ceiling area of 6 ft. 6 in. between units. These fixtures, made by the Ruby Lighting Fixture Co., have a minimum of surface glare, wide spread distribution with well-diffused light over the sales area, and produce the intensities above mentioned. Highlighting in some instances is produced by R-40 lamps installed in a flush-louvered enclosure.

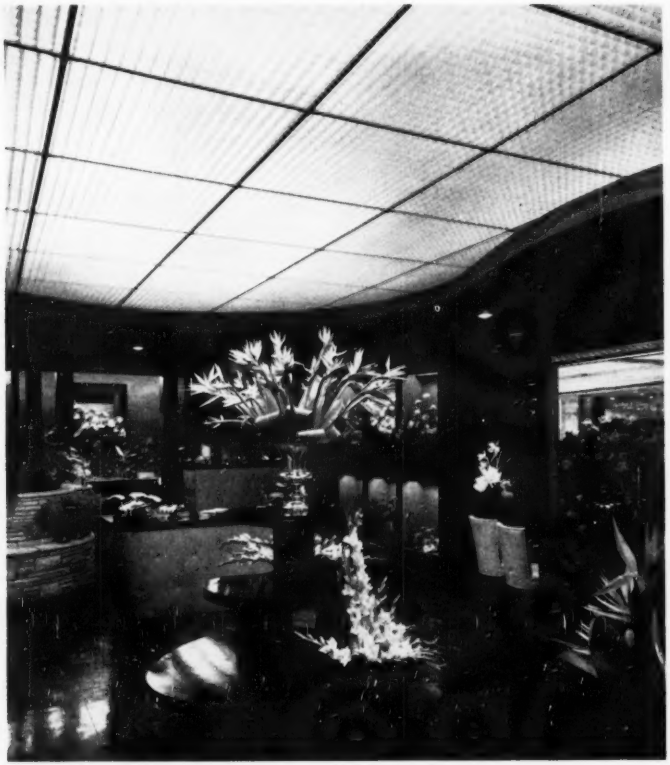
The entire 6th and 7th floors are lighted by means of flush 100-watt circular incandescent units furnished by the California Chandalier Makers. These are installed nine per each 21x21-ft. bay, making the average spacing 7 ft. Maintained intensity at counter height is 12 f-c. Auxiliary lighting will be produced by floor and table lamps in these areas. The 8th and 9th floor areas will be utilized for office, stock and a cafeteria. Office and stock room lighting will consist of conventional suspended and, in some cases, surface mounted fluorescent units, arranged to provide 30 f-c maintained. The cafeteria will be equipped with flush incandescent 30-in. dome-shaped lighting units.

Public Address System

Provision was made for a complete public address system. Flush speakers laid out for low-level sound are installed on the 1st floor for entertainment. Speakers on the other floors, approximately four per floor, are located in partitions and columns. A turntable for records and central controls is installed in the telephone switchboard room.

San Francisco's newest department store, representing an investment of six and a half million dollars, provides the most modern ideas and facilities for department store operation and will prove a credit to the Macy name.

W. P. Day was the architect-engineer. Mechanical and electrical design was done by Clyde E. Bentley, associated with Day. Electrical contractor was Le Moge Electric Co.



Lighting Ideas

Florist Shop

Owner—Broadway Florist, 218 W. 5th St., Los Angeles.

Foot-Candles—Initial 105 f-c.

Main Store—Three continuous rows of three-lamp industrial-type fluorescent fixtures using Sylvania warm-tone lamps. Fixtures mounted 24 in. above completely louvered ceiling. Benjamin Sky-Glo translucent vinylite louvers. Light transmission factor, 71%—reflection factor, 19%.

Refrigerated Room — Similar lighting using 3x3-ft. louvered panels.

Cost—$5 per sq. ft. for louvers, fixtures and wiring.

General Contractor—Basso & Riddell.

Electrical Contractor — Keith Electric Co.

Equipment Manufacturer — Benjamin Electric Mfg. Co.

Serving Company — Los Angeles Department of Water & Power.

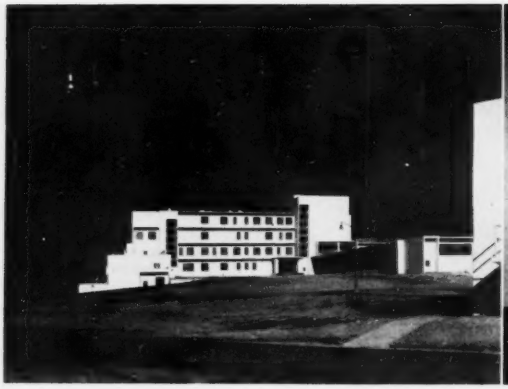
Church Exterior

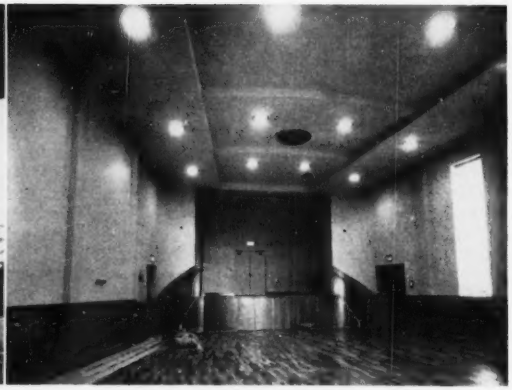
Owner—First Baptist Church, 1115 Harvard Ave., Seattle, Wash.

Floodlighting—Twenty 1,000-watt mirrored-glass Pittsburgh floodlights. Ten of 20° spread focused on tapering spire; eight of 40° spread on the 28x28-ft. square portion of tower. Two 40° beam floods focused on church entry and parking area. Floodlights are mounted at four locations of 3, 3, 2 and 2 each on the church roof and two locations of 4 and 6 each on power poles. Two of latter are for entry and parking. Elevation from ground to base of cross on top of tapering spire is 200 ft. Copper-covered spire was a verdigris considered too dark. Before installing lights this portion of tower was painted a light bluish green. Square portion of tower is of medium grey stone.

Cost—Complete, approximately $5,000. A church member, Frank E. McCoraghy, donated $3,500 to illuminate the tower as a memorial. Through cooperation of church properties committee, Pittsburgh representative, Agutter Electric Co., and Seattle City Light, no charges were made for engineering and some miscellaneous items. With this assistance the $3,500 donation proved sufficient.

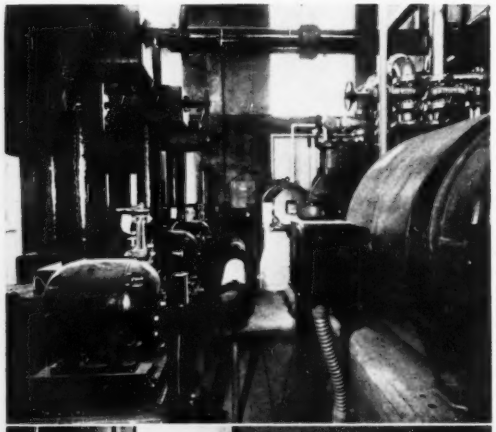
Comment—The cross and a portion of the spire on "The Church of the Lighted Tower" are visible for miles and its inspirational beauty is expanded by the new lighting beyond the daylight hours until eleven o'clock every night.

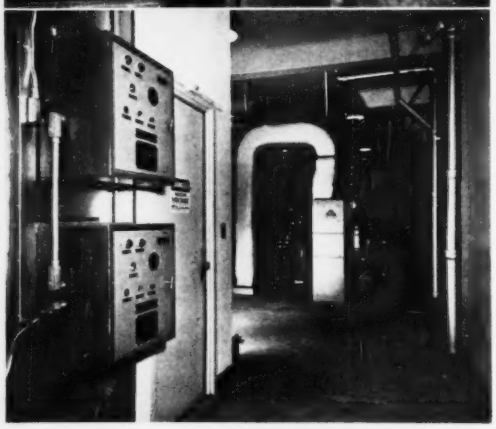




Modern in lines, concrete construction and equipment, the hospital also has an auditorium for the patients and staff

Top Flight Hospital for Air Base



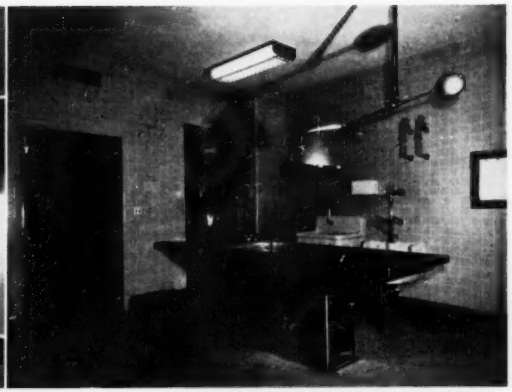


CULMINATION of a 19-million-dollar project begun during the war at the Fairfield-Suisun Army Air Field, in California, was its modern 155-bed station hospital, just completed. It crowns a knoll some distance from the administration building, control tower, operations building, air freight terminal and large repair hanger and the 9,000-ft.-long, 600-ft.-wide heavy runways of the base itself. But the architectural design of functional reinforced concrete used in these other buildings and in enlisted men's and officers' barracks, theater, chapel and post exchange, is carried on in the hospital, built by the U. S. Engineer Corps from designs of Donald R. Warren, engineer. The entire project was built by Stolte Inc., general contractors, and Del Monte Electric Co. was electric contractor. B. A. Solomon, manager of the latter, placed John G. Miklose in charge as general superintendent. In addition to the hospital and above named buildings, the project also included runway lighting, underground distribution, street lighting, signal and telephone systems, a water system and fire control, underground gasoline facilities, a radio range eight miles away, rerouting of ten miles of Sacramento Northern electric railway, numerous auxiliary buildings and shops.

Hospital itself, a four-story, basement and penthouse building, about 500x500 ft. in shape of a cross, contains offices, clinics, laboratories, three operating rooms, one maternity room, one emergency operating room, a surgical dressing room, X-ray laboratories and a morgue; three wards of 24 beds each and the remainder in one- and two-bed rooms, and a maternity ward. There is a library, auditorium, solarium, post exchange and Red Cross quarters.

Two 4,160-volt, 3-phase primaries serve the building to supply two banks of three 100-kva. dry-type transformers (Wagner) in a switchboard built by Columbia Electric. Switchgear is ITE Co. for both transfer of feeders and distribution. In the adjacent boiler house are

Compressors and pumps of reverse-cycle heating-cooling system, above, and electronic precipitator controls in penthouse ventilating fan rooms where air is conditioned



Above, left, typical ward, and at right the morgue with its special equipment

located 500-amp., 4,160-volt switches for the two 150-hp. compressors for the Carrier reverse-cycle air conditioning systems; also 150-kva., 3-phase, 4-wire dry-type Sorgel transformers for boiler house light and power. Similar transformers are used to step down voltage in the nearby nurses and enlisted men's quarters.

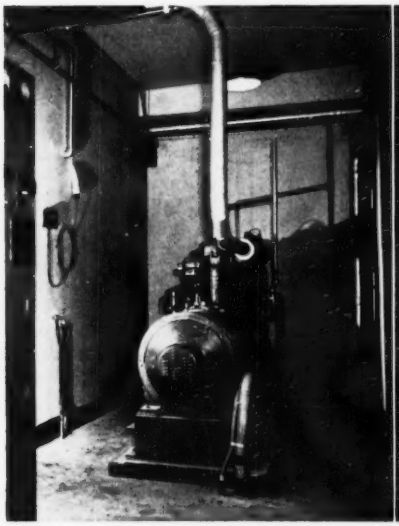
Distribution in the hospital is a conventional 120/208, 3-phase, 4-wire system. An emergency 125-kva. generator, driven by a 250-hp. gasoline engine, provides for lighting in operating rooms, elevators, etc., in case of power interruption.

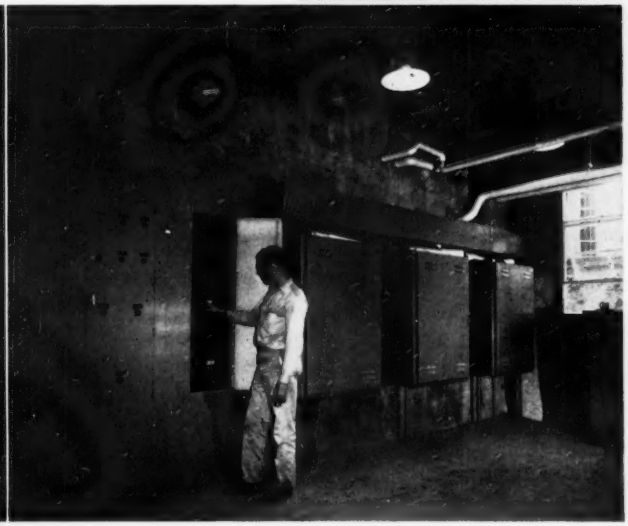
Each of the operating rooms and maternity room have grounded, spark-proof floors and all fittings below the 6-ft. line are explosion proof. Each is equipped with special surgical lighting fixtures, an X-ray viewing luminous panel. The morgue also has two long refrigerated lockers.

Each bed position in wards and private rooms has movable bed light on flexible arm, nurses call, telephone outlet, radio and light control.

All the building is air conditioned, including both filters and precipitators (American Filter Co.) as well as heating, cooling and humidity control.

Auxiliary power for emergency lighting from 125-kva. set, below, left. Distribution center for boiler house where compressors are located, below, right. Main switchboard contains transformers and dual switchgear for transfer from one feeder to another. It is located in main building basement (upper right)





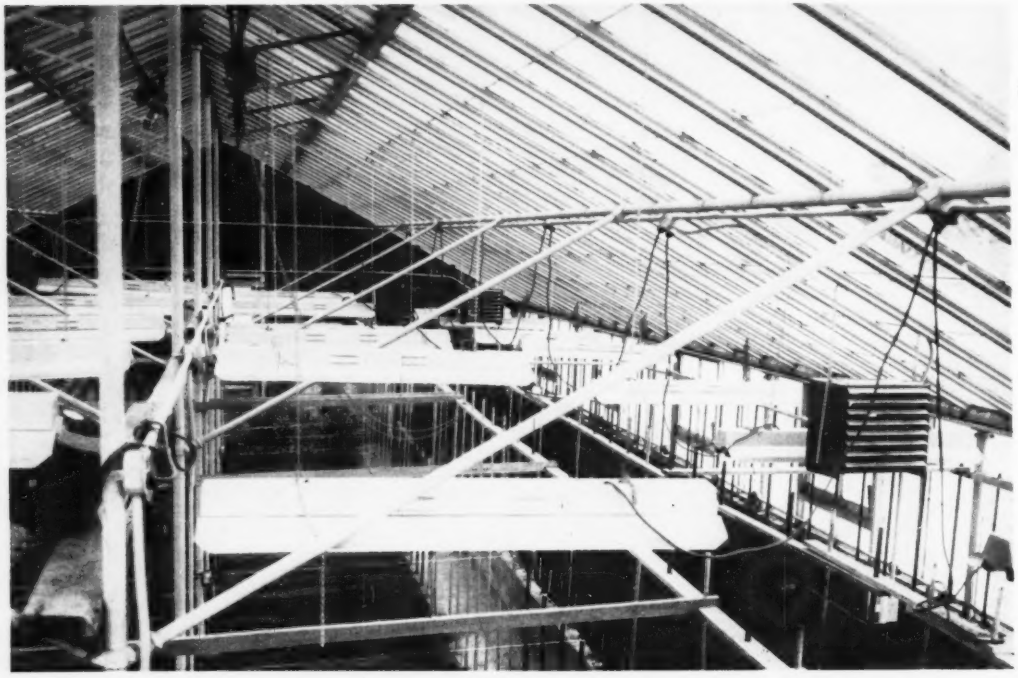
NORTHWEST ELECTRIC LIGHT & POWER ASSOCIATION

Utilization Data Sheet No. 53

SUBJECT: All-electric greenhouse used to speed pea and bean seed development.
CUSTOMER: Washburn Wilson Seed Co., Moscow, Idaho
TYPE OF BUSINESS: Development and marketing of pea and bean seed and packaged split and whole peas, beans and lentils for the grocery trade.
SERVICE COMPANY: The Washington Water Power Co.
PREPARED BY: George E. Romans, commercial representative, Pullman, Wash.

Electrically equipped greenhouse employs soil heating cable, space heaters, and lights to speed plant growth. Upper view shows exterior while below may be seen the 4-kw. space heaters, also industrial fluorescent units using two 40-watt lamps per fixture which are time-clock controlled to maintain an 18-hour day. A phototube control cuts lights out when daylight exceeds 40 f-c.

General: The Washburn Wilson Seed Co., Moscow, Idaho, markets packaged peas, beans and lentils to customers throughout the United States and to an extensive foreign trade. To provide a better quality of products, this company has for many years experimented in the production and development of seed peas and beans in order that their producers would have available the best type of seed. Some two years ago the management of this company realized the need to speed the selection and improve the quality of its pea and bean seeds. To do this it developed and built a completely electric greenhouse employing soil-heating cable, electric space heating, and proper lighting to speed plant growth and shorten the time necessary to place new varieties of seed on the market.

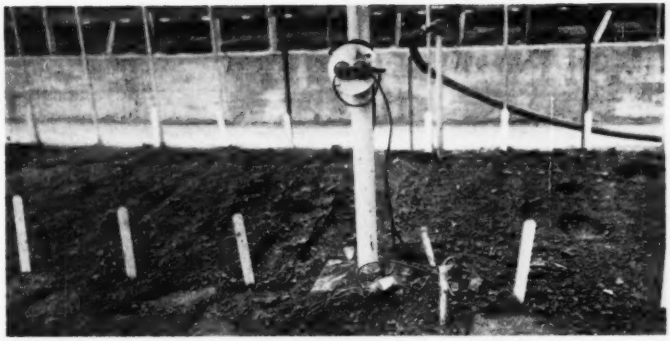


Saving of time is important because of ever-changing customer demand for different sizes or varieties. Growers want varieties giving greater yields or those better adapted to a particular climate or soil condition. Disease resistant varieties must be developed quickly when such conditions appear in order that the over-all production be not reduced.

Purpose and advantages: It is desirable to shorten the time between the original cross or selection of a new variety of pea or bean seed, and the marketing of commercial quantities of this certified seed. It takes eight generations or plantings to accomplish this. With only one 90-day growing season per year in the Moscow, Idaho, area, this would take a full eight years. By making the first two plantings and harvesting two crops of seed in the greenhouse during the fall and winter months, there is sufficient increase for field planting the next spring. This gives three generations the first year and shortens the total time to ultimate marketing to about five years. In addition the greenhouse is used for test plantings.

Lighting: In the case of peas, proper lighting does not shorten the growing season, but maintaining an 18-hour day favorably affects the blossoming and tends to increase the yield. With peas, heat seems to be more critical than light. With beans the combination of light and heat shortens the growing season somewhat and also increases the yield.

In addition to the above advantages Washburn Wilson also has used pictures and a description of its seed development process in advertisements. These advertisements stress speed of development and reliability of the seeds through testing.



Outlet box and connections (above) for soil heating cable. Thermostats are in glass tubes; pilot lights in receptacles at ends of cord. Two 60-ft. cables (200 watts each) are connected to each outlet. Each unit serves 40 sq. ft. of bed and keeps soil at temperature of 70°. Air is maintained at 65° by four 4,000-watt space heaters. Below: Pea vines reaching maturity show excellent growth

Connected Load

Soil heating cable	7.2 kw.
4 permanent heaters, 4 kw. ea.	16.0 kw.
2 auxiliary heaters, 3 kw. ea.	6.0 kw.
Total heating load	**29.2 kw.**
Lighting: 32 industrial fluorescent units, 100 watts ea.	3.2 kw.
Miscellaneous	.6 kw.
Total connected load	**33.0 kw.**

Size of building, 24x50 ft.	1,200 sq. ft.
Total glass area	1,900 sq. ft.
Seed bed area	940 sq. ft.

Seed bed is 26 in. deep and is built up with layers of sand and gravel at bottom for drainage, then layers of manure and top soil above. The soil heating cable is laid 6 in. below the surface and is protected from mechanical damage during planting and cultivating by a covering of metal lath.

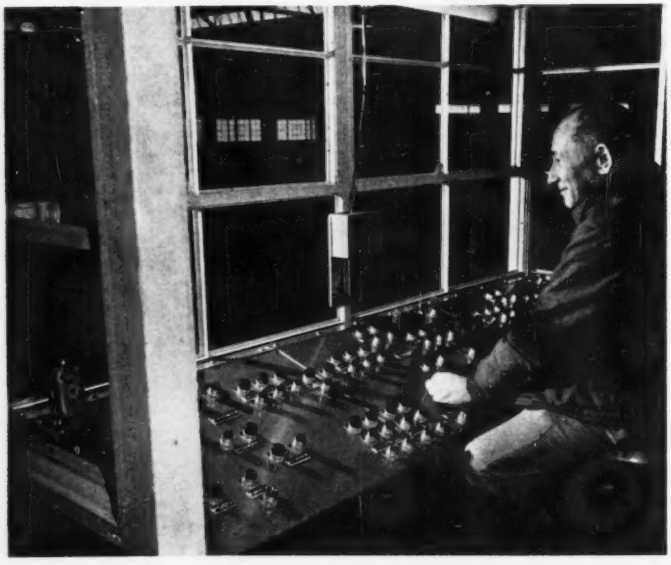
Approximate original cost of building	$2,846
Cost of electrical and heating installation	1,755
Total	**$4,601**

Consideration was given at time of construction to an alternate heating plant using a steam boiler. The total building costs of this plant would have been:

Approximate original cost of building	$2,846
Estimated cost of installating steam heating boiler and equipment at time of building	5,500
Building to house boiler, etc., estimate	1,500
Total	**$9,846**

Average electrical energy consumed per operating month (including lighting)	9,505 kwh.
Maximum demand	33 kw.
Average demand	25 kw.
Average energy cost per operating month	$124

Master Control Speeds Walnut Packaging



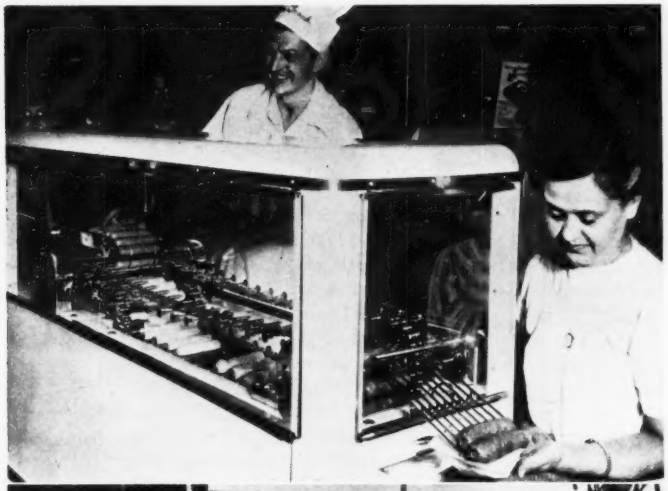
CENTRALIZED electrical control of walnut handling machinery which brands, sorts and packages walnuts has solved a production problem in the new plant of the California Walnut Growers Assn. at Los Angeles. The large switchboard shown, made by the Square D Co., needs only one operator to supervise electrically the entire operation.

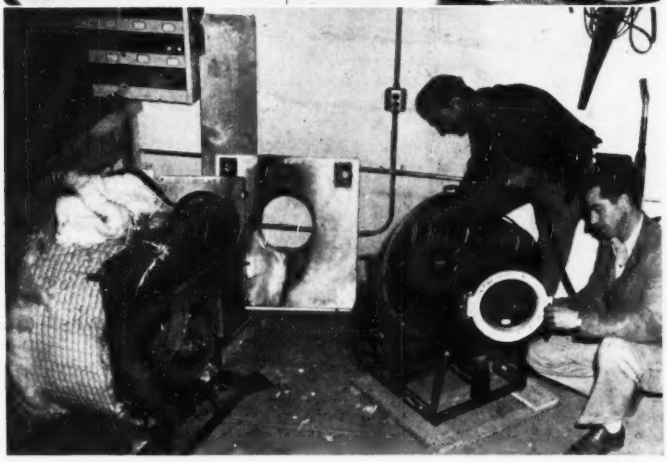
Essential consideration in packaging is that the one-pound cellophane bags contain an even blend of walnuts above the minimum guaranteed cracking standard for Diamond branded walnuts. Controlled machinery is arranged in three sections, A, B and C. Each section is a complete unit capable of operating independently of the other two. Walnuts flow in any section is from storage to a battery of branding machines which deliver to a common conveyor, then to split tables for inspection and culling. From here walnuts travel via a series of conveyors to the overhead hoppers which deliver to the one-pound cellophane bags.

The control switchboard including the control desk, 13 ft. high by 7½ ft. wide, was built in three sections. Each section controls a corresponding section of the plant. Sections A and B are interlocked electrically for combined operation. The lower portion of each section is conventional back-to-back construction. Starters, control relays and timers are on one side. Main disconnect, control disconnect and starter disconnects, are on the other side. Blending is accomplished by a synchronous timer in each section which starts each brander at the exact time required to blend its nuts with those from the branders preceding. When section A and B are operating for combined delivery, another synchronous timer brings nuts from sections A and B together on a common conveyor at the precise time required for even blending. The starters in each section are interlocked so that when any conveyor fails, those conveyors feeding it stop instantly.

The upper portions of each section go together to form the raised console control panel illustrated, mounting push buttons, selector switches and pilot lights for each machine or conveyor, laid out in miniature plan to correspond exactly with the layout of machinery itself. The electrical "brain" makes possible packaging walnuts at the rate of a thousand one-pound bags every minute.

Central tower (upper) contains electrical controls for sorting, grading, blending and packaging walnuts. Control console (lower) has synchronous timers, interlocks, relays and switches giving one man entire control over operations





Have You Heard?

"Fritter Franks" are now out to replace hot dogs, made with a new look by a machine developed by Wright Laboratories of Albany, Calif., with General Electric controls and heaters. Frankfurters are loaded on a conveyor belt, dunked in batter, rotated in hot cooking oil and dropped at the end of the line in form-fitting fritters. Science catches up with the lowly frankfurter

Moral — Don't dry-clean in an automatic dryer, using gasoline. It will explode as this one did. Sold by Fletchers of Santa Maria, to a woman, she decided to dry-clean some clothes in it with a petroleum cleaning solvent. The heat raised the temperature to flash point. The dryer exploded, and is here shown brought in for repairs if possible

Wire recorder saves hours of time and expense for this chicken-breeding farm near Kirkland, Wash. To keep track of strains of laying hens, exact records are kept by Heisdorf & Nelson of the number of eggs laid by each fowl. Now the farm has been wired to permit operation of a wire recorder remotely. Plugs are placed at intervals along the wall, connected to the recorder in the office. A pilot light in the ceiling glows red when the recorder is operating. As each hen is taken from the nest Bert Nelson tells into the mike the number on her leg band and number of eggs. The information is later transcribed from the Pierce recorder onto cards by Mrs. Mary Heisdorf. Wiring cost approximately $75; recorder $450

ELECTRICAL WEST

Prices of Appliances

IT would seem that if prices of appliances are to come down, at the manufacturer's level on through to the consumer, as some already have done, margins should first be increased so that dealers can finance salesmen in the field, increase advertising and promotion. Then if manufacturers' costs can still take reductions, let them be passed on. But to cut price without first increasing dealer margin invites even *less* sales effort.

If the dealer receives only the same percentage of a lower selling price his net will be so low that he cannot afford sales expense. Just because many department stores and a few others are sacrificing excess inventory right now to get themselves in a more liquid condition, is no reason to believe that all dealers will give away in cut prices any increase in margin they receive. The time for selling *has* come. Like anything else, selling *costs* money. It takes incentive pay for salesmen. The retailer must see a return or he will not push the line.

Reduce prices—yes, but increase margins first if selling is what is wanted.

Nature - - It's Wonderful

TWO regional conferences of the Illuminating Engineering Society, in San Francisco and in Portland, again have brought a "sample" of the national convention and national speakers to those of the membership who cannot travel to a far-away convention. Thus the latest accumulations of "theory and practice" is disseminated in accordance with the society's purpose. Everyone is enriched thereby.

An interesting sidelight on the meetings is that the excursions into theory start forth in an austere mathematical straight line. So often that line, perhaps by the relativity inherent in all the universe, swings into an orbit that brings it back to some simple human reaction that was felt rather than known.

The color of "white" light, is one bright example. Approaches to it have been made scientifically by way of the spectrum and wave lengths and mixtures of fluorescents. Now it all swings back to a question of what people *prefer* when looking at various colors. Some prefer a warm or yellowish light, such as the old filament incandescent lamp has had and cannot get away from, for seeing themselves and their clothes and home furnishings. Many a woman would say to that, "Silly engineers! I could have told them that in the first place." True enough, but now it has been proved scientifically as well as emotionally.

Such an experience occurs often in the mental excursions of science after fundamental truth. The road often leads apparently away from the mere opinions of the senses, but somehow comes back to justify Nature after all. The human body may not know *why* it acts the way it does but it has evidently been engineered by some pretty smart Brain.

Bigness vs. Badness in Business

IN the mind of the man on the street "bigness" in any business organization is an almost certain sign of "badness." This popular misconception that somehow or other size and success in business are synonomous with evil and danger is fanned by politicians from presidents on down. It is fostered by so-called liberals whose aim is socialization of industry. And unfortunately the American educational system does little to dispel it. Although knowledge of military and political history is a "must" in educational curricula, seldom is anything on the history or contributions of business and industry required study.

It seems almost elementary to point out that success in any business enterprise, and hence growth and development, can come only when the customer is well served. Whether the business be producing a better mouse trap, or an improved product, either in capital or consumer goods, or whether it be offering a better service—the principal limitation on growth is the satisfaction enjoyed by the customer from the goods and service.

One can insist that in American business and industry, bigness is not badness, but the size and value of the business done is a measure of the quality of product and service offered to customers. Customer satisfaction is not only the cause for size, but it accounts for the profit of this country's large industrial organizations.

EDITORIAL VIEWS

The electrical industry is filled with examples of individuals or groups of individuals who started in a very small way under our competitive enterprise system to produce a product or a service, which because of its value to its customers, brought great growth over a period of years. Unless quality and service and value are maintained, the ability to stay in business is lost. There is a classic example right here on the West Coast. It is the little flat iron business that was started in Ontario in 1904 with $500 of capital. Today it is a big business with its products distributed throughout the world. The accomplishment would have been impossible unless the value in customer satisfaction had been maintained. So it is with scores of electrical enterprises.

Bigness vs. Badness in Government

WHILE the public almost automatically classes bigness and badness together as applied to business, it reacts differently when bigness involves government or one of its agencies. Take the United States Reclamation Bureau as an example. Already one of the largest organizations in the electric power business with some 2,500,000 kw. of generating capacity, it now proposes in the next ten years to increase this figure to 9,000,000 kw. There is no public concern or criticism over this huge expansion in size and power.

Perhaps the public would look with alarm at this kind of bigness in government if it had as its advocate characters such as Senator Benjamin Harvey Hill. Back in 1878 he addressed one of his colleagues in the Senate as follows:

"But sir, I have said I do not dread these corporations as instruments of power to destroy this country, because there are a thousand agencies which can regulate, restrain and control them; but there is a corporation we may all dread. That corporation is the Federal Government. From the aggression of this corporation there can be no safety, if it is allowed to go beyond the bounds, the well-defined limits of its power. I dread nothing so much as the exercise of ungranted and doubtful powers by this government. It is, in my opinion, the danger of dangers to the future of this country. Let us be sure we keep it always within its limits. If this great, ambitious, ever-growing corporation becomes oppressive, who shall check it? If it becomes wayward, who shall control it?? If it becomes unjust, who shall trust it? As sentinels on the country's watch-tower, senators, I beseech you watch and guard with sleepless dread that corporation which can make all property and rights, all states and people, and all liberty and hope, its playthings in an hour and its victims forever."

Who is there in Congress today to re-echo that warning?

To my way of thinking, the most attractive field of our electrical industry lies in the opportunity for Imagineering (with apologies to Alcoa). Here we have the most modern and probably the ultimate form of energy for all human service. Electrical energy is adaptable to every kind of work—to every task, large or small. It can be made available in practically any location as and when needed and in whatever amount needed. To furnish the electricity in ample amounts at these very low costs and as and when needed is our job in the utility business. But that is not all. We want to help out in the manufacturer's field of imagining and planning new applications —the field of ideas. The power salesman is selling two things: (1) electricity and (2) ideas for its utilization. That is the field for the exercise of our creative ability, and it is our job to work with our customer and with our fellow-worker from the electrical manufacturing industry to solve the problem of applying electrical energy to the end of increasing man-hour output and decreasing unit cost. Never was there greater need or such ideas and such service. Hence, never was there greater opportunity. We belong to companies and public service agencies which expect to be doing business for a long time. The better the job we do, the more certain we are to serve the purpose for which we exist.—W. C. Mullendore, president, Southern California Edison Co.

Receivers were placed at various spots throughout store

Customer interviews were made and telecast instantly

INTRA-STORE TV EXPERIENCE

Laurance E. Baty

WHAT can the electrical industry expect in sales of television equipment solely for department store use? The answer is found in the mid-1948 experience of Zion's Cooperative Mercantile Institution in Salt Lake City, Utah.

A standard television receiver with a 22-in. screen was installed in the store's radio and appliance department. Six others, with 12-in. picture tubes, were located about the remainder of the 151,000 sq. ft. of selling space as follows: one in the basement, three on the main floor, one on the second floor, and one on the third floor. The positions of the receivers were changed from time to time, but were kept above eye level at those main traffic centers which were wide enough to permit movement past a gathered group. Connections required about 2,000 ft. of coaxial cable and 2,000 ft. of shielded audio pair.

Two DuMont Image Orthicon television cameras, used by Radio Station KSL for special events, were subleased for the project. The control equipment was kept in an accessible room fitted as a studio on the second floor. The cameras were used in the studio for the smaller shows, in the auditorium for the larger, or anywhere in the store that occasion demanded. Interviews in the store were always adjacent to a receiver, or to a 20-in. monitor just outside of the studio, so that the person interviewed could see himself as he appeared in television.

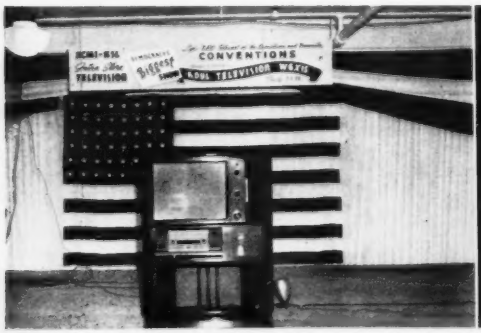
Lighting for the sets was plugged into available convenience outlets, and consisted of five 4-lamp fluorescent fixtures with reflectors mounted on portable racks. Two of the fixtures were placed vertically beside the cameras. The others were arranged horizontally for overhead lighting. Additional 100-watt modeling spotlights were used as necessary. While generally satisfactory, such a low illumination level required extreme care in focusing the cameras.

Harold H. Bennett, vice-president and general manager of ZCMI, arranged the sublease of the television equipment. E. Geoffrey Circuit, ZCMI's sales promotion manager, had active charge of the program and its development. Technical assistance was given by Byron Openshaw, producer; Vincent E. Clayton, chief engineer, and Rollow C. Kimball, television supervisor, all of Radio Station KSL.

The preliminary experimental work included the creation of a variety of sets and backgrounds by ZCMI's art department. This resulted in a better display of merchandise through the available cameras and receivers. Perhaps the most striking, from an electrical standpoint, was the successful synchronizing of a 24 frame/second 16 mm. film projector with the 30 frame/second television cameras. This eliminated a television projector, and enabled the showing of standard-speed films with live commentaries.

One-hour shows were produced at a fixed time each day for four months, together with additional specials.

Large screen receiver in the store's auditorium where groups saw Life's political convention films. Window invitation



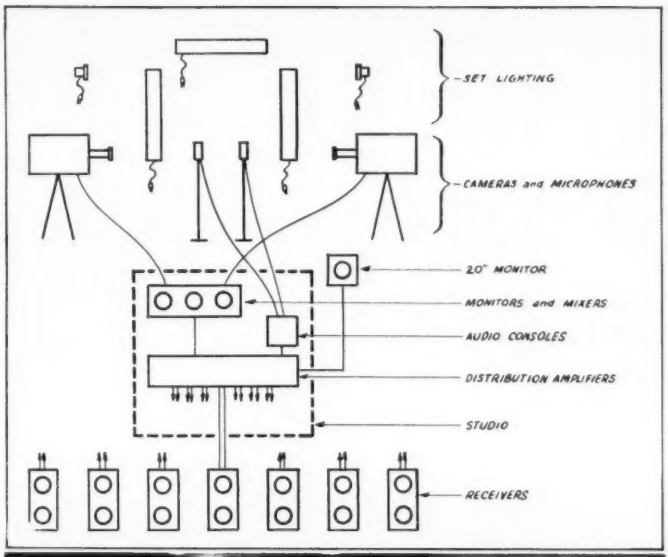
None went on the air, all being confined to the store. The programs included fashion shows, cooking and appliance demonstrations, doll displays on a revolving stage, amateur talent from local schools, interviews of customers and visiting celebrities in the store, ZCMI's radio character —the Story Princess, displays of sundry merchandise specials, etc. Also shown, were *Life Magazine* films flown in from the Philadelphia conventions, as well as local events filmed by the ZCMI staff.

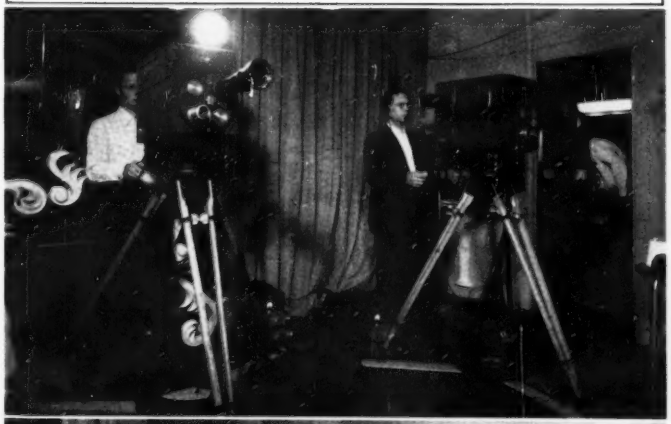
All shows received advance newspaper publicity. The uniqueness of the installation proved to be an excellent traffic getter until television ceased to be a local novelty. Also, the installation diverted increased attention to departments located away from the main traffic centers. Additional sales in such departments were often traced to customers having seen displays and demonstrations in the television receivers. Circuit believes the installation was successful as a pioneering sales promotion feature via intra-store television.

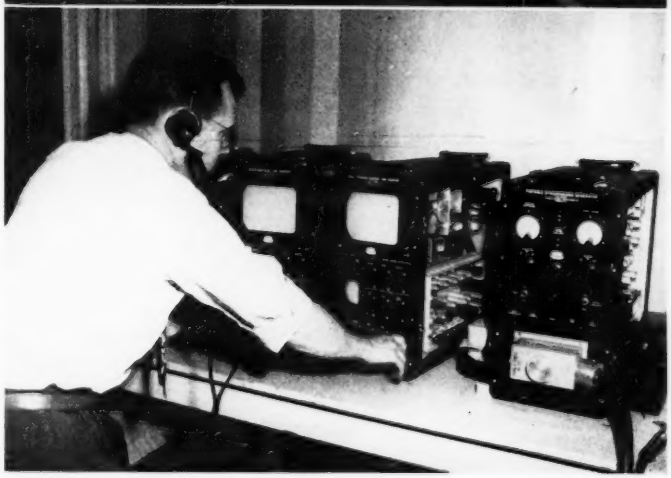
One of the inherent disadvantages of present-day television equipment is its inability to reproduce colors and textures. Another disadvantage lay in the visual and audio qualities of the receivers. Crowding up for a better view did create minor traffic jams. Also, if a loud speaker was adjusted for those at the back of a group, the sound level was too high for those in front and, worse yet, interferred with business at adjacent counters. If the volume was low enough for clerks and customers near the receiver, the full value of the feature was not transmitted to those customers at the back of the group.

Circuit's ideal installation would have (1) costs low enough to fit a normal advertising budget, (2) color television, (3) a large number of low-level speakers producing uniform sound volume over the entire selling space, and (4) a single large screen to each open area. He compares his ideal to an outdoor movie theater having individual loud speakers and a screen visible to all.

The ideal of uniform sound level is already here. If viewers or monitors larger than present standards could be obtained, some scheming might modify the ideal of one giant-sized screen to an area. Color television is in the advanced experimental stage. ZCMI's experience indicates a potential demand, which could be expanded rapidly with improved equipment and industry sales effort.







Equipment required and control studio where V. E. Clayton monitors the show

"Sunshine Package" Lighting Profitable for Dealer Sales

Typical of meetings to prepare dealers with facts and figures for the lamp campaign was this in the Edison building. Top picture shows Henry Rice giving a measure of the market. Center, Art Nielsen and assistant uncrate each of the four packages, set up the lamps, explain features and construction of each. Bottom of page, at the Santa Ana meeting, Dick Buckby gave all dealers a condensed background on seeing and good electrical illumination needs

OH FOR A PACKAGE! A package deal with which to break the home lighting sleep of slow death. Nobody has done anything about home lighting for so long that the situation is desperate. Since the power companies quit their intensive home lighting promotion and direct sales, the market for lamps and fixtures that give real illumination has degenerated badly. The IES lamp is no more. The CLM lamp is having a tough time. What to do about it?

Southern California Edison made an analysis of wiring and light fixtures installed in the new homes built on Edison lines during the first ten months of 1948. It showed there were an average of 36 outlets per house—including convenience outlets, ceiling outlets and switches, and that an average of $45.17 was spent for fixtures, in the 63,000 houses built.

Since it does not merchandise direct any more, how could something be done that would work—something that would benefit customers by offering them good lighting equipment at a reasonable cost, benefit the dealer with initiative enough to sell such lamps with a good profit, benefit the utility of course, in lighting revenue. H. C. Rice, manager of domestic sales, was convinced that it could be packaged into one attractive deal—and did it.

Offered to several manufacturers, one local firm picked up the idea, developed a "package" of five units (even to the packaging and delivery from factory to the dealer's customer) which is now being campaigned. "The Sunshine Package," catchy name, consists of one six-way floor lamp, one swing-arm bridge lamp, one study table lamp, and two pin-to-wall lamps. It is packaged in four sturdy cartons and delivered to the customer's home through a delivery service engaged by Lumidor, the manufacturer. The customer is offered a choice of three finishes—ivory, statuary bronze or old English bronze. The complete package only is sold.

After trying the appeal on its own employees first, Southern California Edison was then ready to offer this package deal to dealers. Santa Ana area was selected first for the trial run. A meeting of dealers of all types of retail business who could and should sell floor and table lamps was called. The potential market for lamp sales in that area was told to them by an Edison man.

The package idea was presented by Art Nielsen of Lumidor. He described the construction and quality of the lamps, then before their eyes opened each of the four cartons that bring the "package" to a customer. The first two contained the bases for the six-way floor and bridge lamps. Another carton contained the table lamp, glassware—diffusing bowls for all the lamps and the lamp bulbs too. The last carton contained the silk shades for floor, table and bridge lamp and parchment shades for pin-to-wall lamps, and the pin-to-wall brackets. All were shown well packed to prevent damage, yet simple to open and the lamps easy to assemble.

Then the profitableness of the package to the dealer was explained. The "package" sells to the customer for $58.05, delivered by the factory to the customer's door. Hence the dealer has no storage, uncrating, assembly or delivery costs. The package costs the dealer $33.05. He makes a gross margin of $25 on each package sold. He is asked to

order three of the packages, one of each finish, for a start and to display them or use in demonstrating to customers in a house-to-house canvass. Thus for $99.15 he is in the home lighting business. When he sells these packages he grosses $75.

It was explained to the dealers that this margin was provided in order to make it worthwhile to engage outside salespeople who would make house-to-house calls to sell the "package." Simplified to the extreme, such sales people could show the lamps, give a lighting benefit talk, sign up the order, turn it in. The order, sent to the factory, would be delivered in a day or two. Dealers are free to make their own arrangements on term payments if they wish.

Final and very effective talk presented at the meeting was by Richard Buckby, Westinghouse Lamp Division. In a quick review he sketched the basis of seeing, fundamentals of good illumination and need for control and diffusion of light from lamps. All of this serves as background knowledge for the dealer and salesman in making a sales presentation.

After these preliminaries an Edison man told of the advertising support the program would receive—advertisements in local papers, mailed brochures to the company's 600,000 domestic customers. Dealers engaging in the program will receive window steamers, display cards, a colorful tag to attach to each of the display lamps. Each salesman will also receive a card folder titled, "Here's the Key to More Lighting Sales." Inside it is the sales material to use. "Our eyes are sunshine eyes" it starts. Then it advises to "bring sunshine to your eyes" and lists eight points to check for better lighting. Back of the folder contains a reading sight test.

Signing up dealers was not done indiscriminately. Only those who were eager to put salesmen out and really push the plan were signed. In Santa Ana the number signed at the meeting was ten. A few more came in later.

After the Santa Ana program got under way the plan was taken to each of the other divisions. It is now in full swing.

As of March 1 there had been held 26 dealer meetings, attended by 163, of which 100 signed up for the plan. At that date 965 "Sunshine Packages" had been sold, a total of 4,800 individual lamps.

"Those dealers who have placed men in the field," said Rice, "are meeting with unusual success, while those who are waiting for the public to come in to buy, I am afraid, are going to be disappointed in the volume of business they will do. The best way to sell this type of merchandise, of course, to these war-built houses which are so lacking in every type of equipment, is to place the "Sunshine Package" on trial overnight. An active and alert salesman can complete three sales out of five by this method."

Southern California Edison it elf is not selling any lamps. It is providing the opportunity and the guidance and the advertising to make it a success for those dealers eager enough to take advantage of such a program.

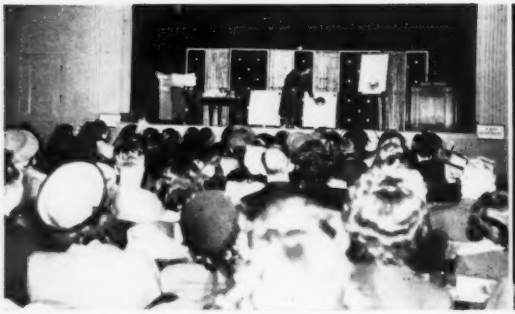
New Distributor in Spokane

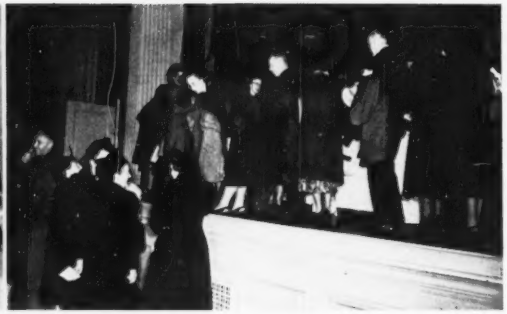
Inland Empire Wholesalers, Spokane, is a new company which has been set up as a subsidiary of Tull & Gibbs, a pioneer furniture and appliance firm in that city. Located away from the parent store, at S110 Wall St., Inland Empire Wholesalers will handle distribution in the Spokane area for Philco radios, phonographs, refrigerators, room coolers and home freezers; Easy washers and ironers; L & H ranges and water heaters; Lewyt vacuum cleaners; Knapp-Monarch appliances and American Beauty irons.

President is Charles Hebberd. Guy S. Hebberd is secretary-treasurer; L. K. Vallandingham, manager of the appliance division, and N. P. Rich, manager of the radio division.

During a three-day open house staged by the new firm there was also a Philco dealer's dinner held at the Davenport Hotel in Spokane, with five Philco officials present for the unveiling of the company's new line. C. S. Bettinger, Western sales manager; T. W. Kirby, manager of the North Pacific division; James Cook, service representative, San Francisco, and H. E. Grimm, Seattle, Northwest representative, all of Philco, attended the dealer meeting.

An interior view of the display rooms and offices of the newly formed Inland Empire Wholesalers, S110 Wall St. in Spokane, which is a subsidiary of Tull & Gibbs of that city. A three-day open house was held to launch the new firm





When possible the Electrical Living Institute classes are livened by demonstrations of typical electrical equipment. Thus at the electric laundry class, Dorothy Holland, Westinghouse Electric Supply, showed automatic washer and dryer operation on the stage. After the meeting students and husbands inspected equipment on the stage as shown here, or the display of all other makes at the rear of the auditorium. Classwork was related to reality in this way

Home Econ's Learn Electric Living

CONCEIVED as a means of making up-to-date information on electrical living available to groups of persons who teach or in other ways impart information to consumers, the Electrical Living Institute in San Francisco are about midway through the semester's work.

The institute was planned as a course to cover the entire subject of electricity in the home—from what it is, how it is made, how it reaches the home and the point of use; to studies and demonstrations of the latest appliances and equipment for living convenience and comfort.

It was planned also, to be of interest to teachers, home economists in business, radio and newspaper women, architects, builders, contractors and interior designers, as well as persons in the electrical industry.

To interest teachers in particular, the course was set up as a series of 15 two-hour evening meetings, or a 30-hour course. Thirty hours are required for two units of in-service teacher credit and it was hoped that it would be approved by school authorities for this type of credit.

Work on this project began with the opening of the school year last September. As soon as the subject-matter outline for the 15 meetings was completed, it was presented to the San Francisco School Administration and approval for in-service credit was requested and granted. It later was approved by the University of San Francisco for two units of upper division college credit in education.

Following this, the course was offered to schools in counties within commuting distance of San Francisco and in every instance it was approved.

To broaden the educational scope of this activity still more, equipment and appliances are exhibited at meetings whenever a subject includes many different types to serve a single household purpose. Distributors have welcomed this opportunity to be represented whether or not their product is being demonstrated from the platform.

All lectures are supported by educational literature packaged in manila envelopes and distributed after meetings. More than one hundred pieces of such literature have been provided by manufacturing companies.

Twenty-five speakers are scheduled to appear on this series of 15 meetings. These represent the best qualified persons from manufacturing, distributing and utility companies, and the fields of radio, television and education.

Attendance varies between 200 and 250 persons about half of whom are teachers. Meetings which include demonstrations and equipment exhibits have been the most popular.

The Electrical Living Institute is the current project of the home economics committee of the Pacific Coast Electrical Assn. under the chairmanship of Marguerite Fenner. The Northern California Electrical Bureau and the Adult Division of the San Francisco Schools are cosponsoring the institute along with the association. Similar institutes are being planned for Los Angeles and San Diego, to be conducted next year.

"Last year," says Miss Fenner," as the project of the home economics committee of Pacific Coast Electrical Assn., we conducted two two-day home economics workshops, one in Los Angeles, one in San Francisco. These were planned for home economists and sales executives working for the manufacturing, distributing and utility companies and dealers. About 100 attended each workshop. But because they were daytime meetings, teachers were unable to attend. However, home economics supervisors and college teachers, as their schedules permitted, did attend. As a result we had many requests for a similar course for teachers, a more comprehensive one, and this institute is the result."

Of interest is the schedule and the arrangement of topics, the speakers programmed to cover them. Other regions may use them as a guide to similar educational programs. In outline, this is the program:

Jan. 26—*What Electricity Is, How It Is Made and How It Reaches Your Home*
Ira Collins, Pacific Gas and Electric Co.

Feb. 2—*Planning For Electrical Living*
W. E. Nagel, Okonite Co.
Elbert Kramer, Westinghouse Electric Supply Co.

Feb. 9—*Television*
P. G. Caldwell, American Broadcasting Co.

Feb. 16—*Electricity and Home Laundering*
(Soaps and detergents, conventional washers, automatic washers and clothes dryers—consumer information, demonstrations and movies.)
Dr. Ellen B. McGowan, formerly of Columbia University

Dorothy Holland, Westinghouse Electric Supply Co.
L. D. Stull, Apex Rotarex Corp.

Feb. 23—*Electricity and Home Laundering* (continued)
(Ironing—preparation of clothes, consumer information and demonstrations of ironing machines and hand irons.)
Dorothy Huse, Proctor Electric Co.
Clea Filsinger, Pacific Gas and Electric Co.
Marguerite Fenner, Pacific Gas and Electric Co.

March 2—*Indoor Climate*
(Electric house heating and air conditioning.)
George Zellhart, Pacific Gas and Electric Co.
John C. Beckett, Wesix Electric Heater Co.

March 9—*Electricity and Food Preparation*
(Refrigeration and Home Freezers—consumer information and demonstrations.)
Marjorie Harper, General Electric Co.
Molly Sylvester, Frigidaire Sales Corp.

March 16—*Electricity and Food Preparation* (continued)
(Consumer information and demonstrations of utensils and table appliances.)
Marguerite Fenner, Pacific Gas and Electric Co.
Christine Dent, Westinghouse Electric Corp.

March 23—*Electricity and Food Preparation* (continued)
(Consumer information and demonstration of electric ranges.)
Howard Oliphant, General Electric Co.
Lois Ferris, Westinghouse Electric Corp.

March 30—*Electricity and Housekeeping*
(Dishwashers, vacuum cleaners and water heaters—consumer information and demonstrations.)
Marjorie Harper, General Electric Co.
C. R. Birkholm, Frigidaire Sales Corp.

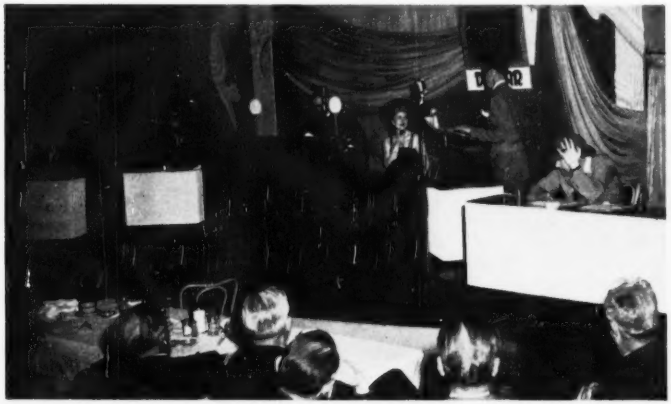
April 6—*Home Lighting*
(Available light sources, theory of home lighting practice and modern residential lighting equipment — lecture-demonstration)
S. H. Hazleton, General Electric Lamp Department

April 20—*Home Lighting* (continued)
(Four Degrees of Residential Lighting.)
Myrtle Fahsbender, Westinghouse Lamp Division, Bloomfield, N. J.

April 27—*Kitchen Planning In the Home*
(Basic principles of modern kitchen planning as related to good home management procedures.)
Julia Pond, California Agricultural Extension Service

May 4—*Kitchen Planning in Homemaking Departments*
Lloyd Bowles, Southern California Edison Co.

May 11—*Field Trip*
(The Pacific Gas and Electric Company will conduct the class on a special tour of their new steam generation plant, Station P.)



The Trial of Alibi Ike Salesman?

Alibilke, right, squirms while Daisy Mae testifies as to his salesmanship. The De-liar screen is to be seen on the wall back of the witness chair

GUILTY on all counts was the verdict of the court in the case of Alibi Ike, alleged salesman, when he was brought before the bar in Dogpatch County, State of Confusion (as re-enacted before the conference of the Bureau of Radio & Electrical Appliances of San Diego. The wartime salesman was accused by the grand jury of violating the Fundamental Code of Selling, known as the ABC's of Selling, on two counts. After a sensational trial, he was declared guilty by Presiding Judge William A. Glenn of San Diego County Superior Court, sitting on this case as visiting justice.

The indictment charged Ike, also known as Alibi Isaac or Isaac Alibi, with "knowingly, willfully, unlawfully, feloniously . . . failing, refusing, and neglecting to *sell* articles of merchandise to desiring customers, and . . . that he did . . . insult, belittle, disregard and pay no attention to customers . . . and did . . . inform customers that he cared not whether they purchased merchandise or not, etc." It was also charged that he produced sales resistance in said customers to the lasting detriment of the honorable profession known as salesman.

The second count was a specific one of insulting one Mrs. Plushbottom, (Florence Orth) at the height of the Christmas shopping, in his treatment of her when she wanted to buy a bed warmer. In the trial Prosecutor I. Gettum (Wm. Hallenbeck) brought the complaining Mrs. Plushbottom to testify against Alibi Ike. The defense attorney, John Fullawind (Ben Hunt), also called a witness, Daisy Mae Abner, who testified that Alibi Ike had a "good line" but did not seem interested in selling merchandise. This testimony did not help the defendant much.

In questioning the defendant it was brought out that he thought he was an electric appliance salesman; he had a card to prove it. When asked to swear to tell the truth he winked at the judge and said. "We don't never tell the truth in my racket, Bud." He admitted he never monkeyed with sales talk. If a customer wanted an electric range he could ask for it.

The court then attached a De-liar to him to flash lights when the witness did not stick to the truth. The instrument flashed continuously. It was discovered that Ike had had 25 or 30 jobs in his three years as alleged salesman. He blamed the boss whom he said demanded he go out and look for business. That kept him away from the store, he said, where all the sales were made.

In finding Alibi Ike (Aubrey Thompson) guilty, the Judge declared:

"The evidence clearly demonstrates that you have violated almost every section of the ABC statutes. Had you followed the exemplary precepts of that illustrious American, Benjamin Franklin, that eminent exponent of Selling America, you would not now be standing before me, a disgrace to your profession.

"You have repeatedly failed to welcome all of the prospect's objections.

You have been content to accept alibis of the 'way it used to be.'

"You have failed to assemble any materials, showing the experience of others; you have not even taken the trouble to be sure what your prospects really want or to find out what they have now. How do you ever expect to sell anything? You have occasionally used leading questions, but even this virtue has been displayed only when the prospect was (1st) female, (2nd) young, and (3rd) beautiful, and the court has refused to listen to the things to which you proposed to lead these innocent victims.

"You seem to know nothing of the technique of finding the prospect's real interests! Indeed, you have not even been helpful and pleasant, save in those special cases already described.

"Your selling pace has been whatever rate of speed your own state of mind at the moment may have dictated. Your personal opinions have been of paramount importance to you at all times.

"The homely virtue of tact has been missing from your behavior. You have deliberately shown only those items of merchandise on which a special commission was being offered. You have been positive and contradicted people who actually know infinitely more than you are ever likely to know, and *besides*, who have money to spend.

"Prisoner at the bar, you have, as I have outlined thus far, committed such acts and been guilty of such conduct that you could be sentenced to the supreme penalty of death. As you know, in this state the defendants sentenced unto death are no longer hanged, as formerly, but are put to death by the use of gas. I have carefully considered that penalty but have decided to give you the benefit of the doubt, because if you were sentenced in this Court and the execution were carried out locally, we would have no gas with which to gas you, in view of the fact that the local gas company may have another emergency.

"You have wasted your own time and that of your customer with interminable stories about your prowess as a fisherman, (although the Court is unable to find any evidence that you even know how to bait a hook) and other extraneous things, including the fixation you seem to have that you are a lady-killer.

"It is a well-known fact that telling the whole story is one of the true techniques of good selling. It tends to make the sale wholesome, shut off competition and build up the purchase. It is to be presumed that you know all of these facts. Certainly you have, by some means, managed to keep on someone's pay roll long enough to have attained a certain maturity as a salesman. But there is no shred of evidence to indicate that you have ever utilized this presumed knowledge.

"In all my fifty years on the bench I have seen no more flagrant case. Nevertheless, this Court proposes to give you another chance in the hope that you may be rehabilitated.

"Since you have asked for probation and it lies within the discretion of this Court to consider your application, to consider whether or not you are able to rehabilitate yourself, I have determined that you are entitled to, if I may say, 'the last chance,' and I am going to grant you probation upon certain terms and conditions as follows:

"1st: The probation officer of this Court, Dan Turner, is directed to assume and is hereby appointed to supervise your rehabilitation.

"2nd: You shall enroll in a suitable class as designated by the probation officer of this Court, and attend the same faithfully, and report weekly to the probation officer and make every effort to apply the knowledge which is made available to you.

"3rd: You must learn the following to get off probation:

"A. Get your customers talking. Discuss prospective buyer's needs—ask leading questions—find their interests.

"B. Be agreeable. Be helpful and pleasant—suggest instead of tell—sell at the right pace—demonstrating instead of arguing—be sportsmanlike about competition.

"C. Get together with customers. Welcome all objections—find the real objection — answering with a 'yes, but . . .'

"D. Keep your neck in. Show them what they ask for—make suggestions tactfully — handle competition with care—avoid being too positive.

"E. Tell the whole story. Make the best use of time—'bridging' from one point to another — help them buy what's best for them — shut out competition — build up the purchase.

"4th: You shall partake of no intoxicating liquor during this term of probation; shall be a dutiful citizen; lead an exemplary life and violate no more laws of this jurisdiction.

"If you faithfully, for the period of one year, carry out the terms of your probation, at that time this Court will again review your sales record and will again review your progress in salesmanship and take such further action as may then be deemed proper."

Script for the trial of Alibi Ike was prepared and directed by Dan Turner, supervisor, Visual Education department, San Diego Gas & Electric Co., who conducts the bureau's sales training program.

Lighting Fixture Business

Lighting fixture business in 1949, according to Ed Striker, General Electric Lamp Department executive in charge of utility and fixture interests, should be an awfully good business, but it will be different. Striker addressed an informal group of fixture manufacturers and representatives at San Francisco on a recent tour of the company's Western offices. At the Bay region meeting he was presented by F. J. Falge, G-E lamp manager, North Pacific district, Oakland.

The business will be different in that the grey market in steel and aluminum is ended, shortages are over and business must be scratched for but is good in potential. Competitive situations may be rough, with distress merchandise dumping, but when it happens the business will not go to the dogs, he reassured the group.

Striker outlined the company's policies, discussed the values of the certification programs in the industry, told of the present status of the lamp makers' antitrust suit. He told of G-E's new Circleville factory, just opened, the largest lamp works in the world, which will specialize on fluorescent and slimline lamps. Soon slimlines will be in such quantity that promotion will be intensified to sell more than the present demand. A new 96-in. T-12 slimline, operable at 400 ma., will soon be announced and be obtainable later this year. He also answered numerous questions from the group.

● Reverse English is put on "The Basic Principles of Good Salesmanship" in a novel treatment of the well-worn subject, published by National Electrical Wholesalers Assn., which takes the place of its February "Appliance Sales Booster." Albert Pfaltz, the author, contrasts the eleven principles of selling, as presented in the NEWA-EEI sales training courses, with advice by "Prof. Sylvester Quarterwit, alias Hokey Poke, exponent of the take-it-easy school of promotion." Thus by reverse telling, the value of the eleven principles is reemphasized. Copies of the four-page pamphlet are available in quantities from NEWA, 500 Fifth Ave., New York City.

● Hawaiian Electric Co. has re-established its lighting advisory service. Free help on lighting problems is offered under the guidance of Miss Margaret Jean Bolte who heads the lighting advisory service for Hawaiian Electric.

ELECTRICAL WEST

Sales Guide

FOR THE ELECTRICAL MERCHANT OF THE WEST © APRIL, 1949

Price isn't the Answer—Selling Is

by Ken Hampton

PRICE is rapidly becoming the most important consideration in sales. Women are shopping not only for their favorite brands, as has been the case for some months, but in store after store salesmen are being confronted with the problem of women saying: "The price is too high. I'll have to wait" or "What discount will you give me." These are conditions with which many of our people are not trained to cope. Often their first impulse is to cut the price. This line of least resistance, if taken, very often leads to failure—failure as a salesman and harm for the store and product.

Unfortunately, price cutting has already become almost a general practice in some areas. It has, to a considerable degree, taken the place of hard-hitting, effective specialty selling.

With price looming as a factor of increasing importance in all sales, there is a responsibility to sell features. It is important to make good sales presentations accompanied with good demonstrations, both in the store and home.

After sales, home demonstration calls also become important as a means of keeping the owner fully satisfied with her purchase and of obtaining prospects for new sales.

Let's see how the specialty store—all successful appliance departments in stores operated in the prewar period.

They carried on an effective program to get prospective customers into their stores. This consisted of advertisements in the newspaper almost daily and some radio advertising. Reminder copy on outdoor billboards and good feature selling window displays were used.

Salesmen pushed hundreds of door bells day after day, week after week. These men were experienced, intelligent salesmen who met, often each morning, in sales meetings. In these meetings, successful sales efforts were talked over and adopted by the whole staff. Junior salesmen were employed to work with the older men as trainees.

Today the lack of soundly conceived, aggressively promoted selling plans is alarming. Smart merchandisers who are organizing to sell aggressively again are too few and far between. Too many are sitting back complaining about lack of customers, talking about shortages and generally wasting time worrying about lack of volume and profit.

There recently crossed my desk a study which indicated that of 25 dealers in one

town, only eight had done any newspaper advertising in the first half of 1948—only one employed true outside selling effort. Further study indicated that the majority of the 18 just didn't believe in that sort of thing. All of the 18 claimed that their trade discount was too small to carry on outside selling effort. Yet it was these same stores that were doing all of the price cutting in the town.

Most price cutting is the product of the dealer being short on merchandising knowledge and initiative. To succeed, price cutting must be abandoned for true specialty selling.

It is always hard to do an about face, either personally or in business.

There is complete agreement among the leaders in the industry that 1949 marks the beginning of a period when specialty selling will be necessary to enable the electrical appliance retailer to make a profit. These leaders consistently recommend:

1. **Offer in your store the very best quality merchandise possible.**
2. **Have a good selection by price ranges of merchandise offered for sale.**
3. **That there accrues a benefit in concentrating on well-known manufacturers lines and it is not necessary to overlap price lines and show two manufacturers lines.**
4. **That a consistent advertising program is essential.**
5. **That store demonstrations are necessary.**
6. **That door-to-door selling is necessary at least to the point of calling on prospects who have been to the store.**
7. **That successful follow-up of users can result in increased volume in two ways, e.g., by selling additional merchandise to the present user and obtaining the names of prospects who may be sold.**
8. **That after-sale, home demonstrations are necessary.**
9. **That proper installation and after-sale service is very important.**

To sell most profitably in 1949 means to heed their advice.

"Ref'er" Reasons

Benefits are what people want when they buy a refrigerator. The features and gadgets of the particular make you sell are there to provide them with some benefit. But the basic benefits, which sold millions of refrigerators in the first place, are still the strongest sales influences Why assume that everybody knows them. They may not. They may have forgotten. They will justify their purchase of a new refrigerator from you now. So take them out of moth balls and put these benefit reasons back to work, selling for you—

1 **Protect the family health** by protecting its foods from spoilage and waste. Bacteria cannot multipy in below 40° temperature. Milk, meat, and all foods can be kept fresh long periods in an electric refrigerator.

2 **Saves the food dollar** that has shrunk so lately. Allows the homemaker to buy in quantities when available and keep it safely until used.

3 **Saves time and expense of shopping.** Fewer trips to market at savings in use of the car, traffic worries, bother.

4 **Saves with leftovers.** Need not be eaten right away so as to tire of them, but can be kept and used in different ways some days later. Cooking in quantity can save time too.

5 **Makes delicious frozen desserts** quickly and easily.

6 **Keeps you well supplied with ice** for summer drinks and other uses.

7 **Newest models provide more storage** for frozen food packages. Also more refrigerator space for the same size cabinet.

8 **Operating cost is about half** what a 10 year old or older model was.

9 **Handsome styling** and modern appearance modernizes the kitchen.

ELECTRICAL WEST Sales Guide

News Letter

FOR THE ELECTRICAL MERCHANT OF THE WEST

April 1949

©

Sure there's business

Spring has come and prospects brighten, despite many cloudy outlooks and gloomy forecasts. Out where people live there are still many who need and want appliances. There are still more people employed than not. Dealers and salesmen who hit the doorbells and chase the prospects are making sales. Don't let the armchair statisticians and prognosticators get you down.

Prices weaken

Several manufacturers have dropped the prices of some appliances. General Electric and Frigidaire from 5 to 10% on many models. G-E is bringing out some new lower priced models. Westinghouse says its 1949 models were introduced at prices comparable with the situation; has cut radio and TV prices also. Others can be expected to do the same.

Cutback cure

Cutbacks in production will soon cure some of the rash of overstock and liquidation selling that has been especially bad in Los Angeles. When L. K. Ward chain of appliance stores folded, stock of appliances was sold to auctioneers by the banks. Several others bought up distress stocks and an auction war was on. "Shills" in the crowd bid prices to about 15% below list, but the war cost other dealers many sales, left them stock-heavy. Conscientious distributors and manufacturers couldn't reabsorb all the backup nor police all the Fair Trade violations.

Inventory control

Westinghouse appliance production will be cut back 25%, R. W. Clark, vp of sales, told a San Francisco press conference. As president of NEMA he said other companies were doing the same to keep the inventory surplus in hand. Warehouses everywhere are pretty full of almost everything now. Whether steel will cause shortages later in the summer is not foreseeable, for even steel sheet is in good supply now.

Explosive

Gas companies in southern California are tempting odorous reprisals to the unfair and somewhat faked comparison tests they stage in "Judge and Jury" meetings to dealers, seeking to discredit electric cooking in favor of gas. Don't they know it's not safe to go around looking for a gas leak with a lighted match?

Shift

Gough Industries of Los Angeles gave up its L&H range and water heater line when Philco took over Electromaster. Ray Thomas Co. has taken L&H. Also handles Launderall and Columbia Records, etc.

Band wagons

Promotions and sales campaigns are back in order and most every locality has one cooking. Inland Empire Electrical Dealers Assn. will sponsor an Electric City in the Spokane Home Show, May 14-22. Northern California Electrical Bureau launches its big contest and promotion, "Step Ahead with Electrical Living," beginning May 1. Rocky Mountain Electrical League's spring conference at Cheyenne, April 21-22 will initiate a new phase of its Go All Electric campaign. Southern California Edison is readying a bigger than last year range and water heater drive. Bureau of Radio & Electrical Appliances has a spring Ironer sales event on May 2 and starts a combined electric range and freezer promotion in May also. And that's not all. Every manufacturer has individual product promotions to push sales this year.

Overload

An electrical merchandise safety bill sponsored by Inland Empire Electrical Dealers Assn. was killed in the last days of Washington State legislature when other interests tried to load on it the licensing of dealers and considerable bureaucracy for enforcement and jobs.

TV roundup

In a paragraph, here are television highlights: Zenith exploded a grenade with its full page ads inferring that everybody else's TV set might be obsoleted by new higher frequency channels. It was turned down by 11 newspapers, protested by the industry; FCC Chairman Coy was put on the spot but escaped with skilful Federaleese word juggling; Admiral's President Siragusa deplored that he too did not have a crystal ball but advocated, "Let us be merchants, not fortune tellers!" . . . Philco engineers, having tried out the Ultra High Frequencies say it takes more power, is more affected by shadows, but cuts out ghosts and auto pips, and that a simple gadget can make any set adapted to receive it. . . Motorola agrees with Milwaukee city officials that automobile television, while perfectly feasible, should be kept for the back seat; would cause accidents by distracting drivers, might keep "back seat drivers" busy. . . RMA reports that TV set shipments rose 88% during the last quarter of the year. . . Northern California Electrical Bureau and nine distributors had to give up sponsoring afternoon broadcasts from KPIX as demonstration programs to help sell sets, but the station started baseball videocasts which revived interest in sales. February sales in San Francisco were 289, sold by 87 of 248 dealers. . . San Diego's station KFMB-TV was unfrozen and is under construction on Mt. Soledad, with Jack Gross pushing its completion. . . KGO-TV, the ABC station in San Francisco, begins programs in May. . . Trends in sets are going two ways—to some lower priced models, and to 16-in. tubes in deluxe jobs. . . UCLA has started a television course, taught by ABC's Richard Goggin.

Record players

Admiral announced a record player that will play all three speeds, 33, 45 and 78 and records big and small, in all 24 of its models of radiophono and TV combinations. . . Stewart Warner announces a choice of changers and one model with two changers to play all four sizes and speeds.

Pardon me

Hard water and magnesium anodes in water heaters sometimes burp gases that are generated by chemical reaction. NEMA water heater members held a hot session over the problem with Dow Chemical chemists. NEMA issued a statement on the problem for your use with customers. In extreme cases the anode removal is recommended, but then its anti-corrosion value is lost. At least it will kill that rotten egg smell.

Deepfreeze will begin making refrigerators, five models, from a new plant in North Chicago. Started with 15,000 orders, resulting from its reputation in making good home freezers. — Going deeper

Sues, Young & Brown will concentrate in the southern California area, says Pete Sues, Pioneer Appliance Co. has taken on Coolerator in northern California. London Records will operate its own branch. MGM record distributor has not been appointed as yet. — Concentrate

McCormack & Co., which has taken over Admiral in northern California, was host to an Admiral distributors meeting in San Francisco, Mar. 24-25, at which W. C. Johnson, vp & gm introduced the new Admiral triple-play, as well as ranges and refrigerators. — Host

Robert M. Oliver, long identified with Proctor, has just been made general merchandise manager of the traffic appliance division of Landers, Frary & Clark, makers of the Universal line. Universal has announced big promotions on its new Coffeematic with a flavor selector and metal basket; and its Beam-O-Lite iron with a headlight to see around buttons and bows. — Table tops

Westinghouse Electric Supply held open house last month at its new Vernon Calif. branch, which separates its appliance and radio stocks and show rooms from the already overcrowded supply house on East Second in Los Angeles. M. B. Sauer, manages the Vernon branch under Lou Berger. Headquartered there for the division, which includes Salt Lake City, Boise and Phoenix branches, are W. W. Bell, sales manager, R. J. Wells, stores manager, B. A. Olson, sales promotion, J. B. Heazlett, credit manager, Don Johnson, radio and TV service manager, Elbert Kramer, district sales promotion manager, J. H. McCarty, district service manager. — Split atom

Pacific Power & Light Co. has ended its range repair business in the Portland area. Repair parts have been sold to Electric Home Service which will handle the range work formerly done by the utility. — Ends range repair

June 2-12 are the dates for the 1949 National Home and Building Exposition at the Pan Pacific auditorium, Los Angeles. Big attraction will be two moderately priced model homes to be given away on the last day. — Show dates

Distress boards to help appliance dealers out of financial difficulties have been set-up by the Inland Empire Electrical Dealers Assn. in its various chapters. Will work with wholesalers in offering solutions to dealer problems. — Dealer doctors

"Modern Electrification Helps Sell New Homes," an eight-page booklet, has been prepared for builders by the Better Homes Bureau of Westinghouse. Booklet advocates a "basic electrical package" in new homes, presents minimum wiring requirements and a suggested wiring specification. Also includes standards for kitchen and laundry layouts. Copies may be obtained from the Better Homes Bureau of Westinghouse, P. O. Box 868, Pittsburgh 30, Pa. — Booklet

Westinghouse Appliance Division is starting a training program for service men affiliated with its dealers and distributors. Meetings are being conducted throughout the country by distributor service supervisors, says Jim Brown, field service supervisor, San Francisco. — Training course

Combination table lamp and radio, called Lumitone, is a new product of Mitchell Mfg. Co. Lamp is styled in cream color plastic with a matching base in which radio dial is mounted.	Dual purpose
Proctor will market a new steam-or-dry iron in the spring. Is similar to the Never-Lift, but has heavier soleplate with steam vents and provides for water reservoir attachments. Can be changed from steam or dry iron by a flick of a valve at the top of the water chamber.	Wet or dry
Los Angeles will have a new $10,000,000 mart building at Washington Blvd., Broadway and Hill Sts., providing 2,000,000 sq.ft. of floor space for exhibitors. One feature—a 1,000 seat auditorium.	L. A. mart
Toastwell has introduced a four-slice automatic toaster with the same features as the two-slice Toastwell. Will sell at $29.95.	4 at a time
Price reductions up to 15% on electric water heaters in the Heatmaster line have been announced by Combustion Engineering - Superheater Inc.	Down
Hotpoint says its 1949 range line includes new models and lower prices. Full size standard model range will retail at $179.95.	New and low
"Light for Seeing on the Farm," a two-color, 16-page educational and promotional booklet has been prepared as part of the Planned Lighting Program sponsored by Edison Electric Institute and Better Light Better Sight Bureau. Shows farmers how good light can help increase farm production, reduce chore time, prevent accidents. Can be obtained by writing EEI, 420 Lexington Ave., New York 17, at $95 per 1,000 copies, or $10 per 100 in quantities below 1,000. Back cover has been left blank for local imprinting.	Light on the farm
Cory has prepared a small replacement parts package for its dealers consisting of an assortment of parts most commonly called for. Is packaged in a self-dispensing counter display carton.	Parts package
Door-to-door campaign on home lighting has been started by Central Arizona Light & Power Co. in cooperation with local appliance dealers. Lamps will be sold through dealer channels. Promotion is backed by radio and newspaper advertising.	Lighting promotion
Bus riders in San Diego may be riding to music. San Diego Transit Co. has such a plan under consideration. Hasn't decided yet whether recording instruments or FM radio receivers will be used. Either way, entertainment will probably include commercials.	Music on buses
Gibson has a series of thirteen 35 mm. Playlets, portraying and demonstrating Gibson refrigerators, ranges and home freezers, which can be displayed on screens of regular moving picture theatres. Playlets last less than one minute.	Films
The new Toastmaster deluxe electric water heater, made by McGraw Electric Co.'s Clark Division, is available in sizes of 40, 50, 67, 82 gal. capacities. Its deluxe line is in addition to the standard model line.	Deluxe line
Three new wringer-type Duchess washers have been introduced by Appliance Mfg. Co. Models range in price from $99.95 to $139.95.	New washers

ANACONDA
from mine to consumer

DURALINE* WEATHERPROOF COPPER WIRE
WITH INTERLOCKED-FELTED CONSTRUCTION

Anaconda Duraline prevents moisture penetration, even during long periods of wet weather! Interlocked-felted Duraline, with time-tried URC saturants and finishers, stays dry inside. Because it is dry, Duraline is unusually safe from outages caused by foreign objects contacting the lines.

*Reg. U. S. Pat. Off.

For protection during emergency periods of adverse weather . . . and through the years . . . specify Anaconda Duraline URC Weather-proof . . . carried in stock by General Electric Supply Corporation.

ANACONDA
from mine to consumer

ANACONDA HY-THERM* COPPER

Anaconda Hy-Therm Copper will carry over 20% more current at higher operating temperatures than representative commercial copper! Accepting maximum operating temperatures of 75-80° C as satisfactory for high quality commercial copper, Hy-Therm could be rated at 110-115° C. Even on a more conservative basis of 100° C, Hy-Therm will carry approximately 20% greater current . . . while having an anticipated useful life 3½ times as long.

*Patent applied for. Brand AHT (ANACONDA HY-THERM).

Anaconda Hy-Therm Copper can be obtained in hard drawn bare and weather-proof conductors from General Electric Supply Corporation at no increase in price.

In dealing with General Electric Supply Corporation, you are assured of the finest materials obtainable . . . materials in which both the maker and supplier take a real and lasting pride.

GENERAL ELECTRIC SUPPLY CORPORATION

SAN FRANCISCO • OAKLAND • SACRAMENTO • FRESNO • LOS ANGELES
SAN DIEGO • PHOENIX • SEATTLE • PORTLAND • TACOMA • SPOKANE

To put New Life in the Ol' Industry

IF people have any idea that things are blue in the field of electrical appliances for electrical living, the "Step Ahead with Electrical Living" drive now being readied for launching, May 1, in northern California will dispel such a thought. That shortages are over and there's no need to wait for electrical living appliances, lighting and wiring, and that the dealers and contractors are anxious to serve them will be publicized in the biggest all-industry campaign ever conducted in that area. This is the program the Northern California Electrical Bureau will unleash for a 45-day run throughout that part of California, according to LeRoy H. Bennett, director of activities.

To bring the public to dealer and contractor stores and to make from it an active prospect list for dealers, the heart of the drive will be a prize limerick contest offering prizes of over $10,000 in electrical living equipment. By bringing the public into stores to obtain entry blanks, the Bureau believes dealers will have a chance to recreate interest in appliances, radio, television, home lighting and certified adequate wiring.

First prize will be a complete electric kitchen installed with appliances of the winner's own choice supplied by the Bureau. Electrical contractors association members will provide the certified wiring for it. Second prize will be a television set, or radio-phonograph combination, or modern lighting fixtures for an entire room, furnished by the lighting committee of the Bureau. Third prize will be a complete electric laundry of washer, ironer and dryer. Fourth prize is an 8-cu.-ft. home freezer. In addition to these major prizes the various units of the Bureau may offer local prizes also.

Any dealer can participate, whether a member of the Bureau or not. However, only members will be furnished the advertising banners, promotion pieces, etc. free; others will pay for such materials.

To enter the contest, which will be widely advertised, a person will be required to go to an electrical dealer's store, ask for the application form which is especially printed for the contest. Besides a choice of two limericks to complete, it contains the simple rules. The dealer will answer questions and furnish his own literature to contestants to acquaint them with the features and values of electrical living. The contestant may either fill in the last line and deposit the entry then at the store or may take it home to fill in. He or she must print his or her name plainly on it, give the home address, also the name, address and telephone number of the dealer from whom the blank was obtained or from whom he regularly buys. Also the contestant must name the appliance that he or she hopes to buy next. Contestants may mail in to the Bureau as many entries as they wish.

Winners may choose any make they prefer within the price range allowed in the contest. And to prevent contestants from delaying purchasing a wanted appliance until they see whether they win or not, any appliance bought before the contest closes can be credited.

It will be the most extensive promotion the area has ever known, says Bennett. In all more than $75,000 in advertising will be done. Pacific Gas & Electric Co. will run two large ads in May and one in June in 310 papers in the area, use 1,635 truck cards, send out a million bill stuffers. The Bureau will supply each dealer with two-tone, fluorescent-paint window and store streamers, large display cards with a list of the prizes, entry blanks, and mats to use in their own newspaper advertising. Wholesalers in cooperation with their dealers will run both newspaper and radio ads besides some direct ads of their own. Manufacturers of appliances and fixtures will run some ads to tie in with the program. The newspapers of the area will be alerted to develop special pages and publicity for the event.

Judging will be completed between June 15 and July 1 and prizes announced with proper fanfare and publicity about July 1.

In preparation for the drive a big kickoff is being planned in early April, for all wholesaler salesmen, PG and E personnel and dealers. "We're going to put electrical living back into first choice as the best way of life, the American way," said Bennett, emphatically.

● L. E. Wood Co. has established a Westinghouse appliance shop in Pocatello, at Center and Second St. The Wood Co. main store is in Idaho Falls, where furniture and appliances are sold. The Pocatello store has the exclusive Westinghouse franchise for that city now. T. Leland Newey, is manager. The main floor 30x82-ft. space is devoted to the full line of appliances. A basement will later show some furniture lines. The store boasts of the "best lighting in Pocatello" with new Westinghouse 4-lamp fluorescent units combining bullseye spots. A model kitchen and laundry is planned in the near future.

● Nema Movie Guide, 1948-1949 edition, is available to any company or association interested in showing films on industrial, public relations or training subjects. It lists electrical subjects available from a large number of sources, both from industrial companies and from film libraries elsewhere. The guide gives title, running time, color, price for sale or rentals where required, release dates, sources, and a brief review of the contents.

● Pocatello Electric Co., Pocatello, Idaho, has enlisted its journeymen electricians to aid it in selling appliances, giving them a sales commission on any sales for which they are responsible.

TIGHT JOINTS

AT ALL POINTS . . . "VIA GRAYBAR"

Reliable Connectors, Splices

Graybar can supply everything your linemen need for connecting all types of lines *securely*. Some examples, made by Reliable: (1) Solderless tap connectors, with precision threads that maintain high-pressure joints. Composed of 90% copper high-strength bronze, they resist corrosion and are not subject to season cracking. (2) Flip-on tap clamps and hot line clamps. (3) Straightline splices, insulated splices, and splice reducers.

O-B INSULATORS

In these days of overloaded distribution systems, no line is stronger than its insulators. Graybar supplies superior-quality Ohio Brass insulators in strain, pin, and suspension types.

ONE SOURCE FOR ALL

For both transmission and distribution lines, Graybar has everything "from the bottom of the hole to the top of the pole"! By ordering all your pole-line needs from this single source, you save time and paper-work expense. You get the leading lines of poles, crossarms, insulators, hardware, strand, line trucks and tools. And you get them the quickest way possible — delivered wherever you specify.

Men who know your needs

When you call on Graybar, for supplies or for information, you can expect us to meet your needs both promptly and accurately. That's because Graybar has been familiar with your needs ever since the first lines went up. You're welcome to the help of the near-by Graybar Outside Construction Specialist in planning any pole-line or underground project. *Graybar Electric Company, Inc. Executive offices: Graybar Building, New York 17, N. Y.* 48A6

SERVING THE ELECTRICAL WEST

NOW! A NEW SOURCE OF ACSR

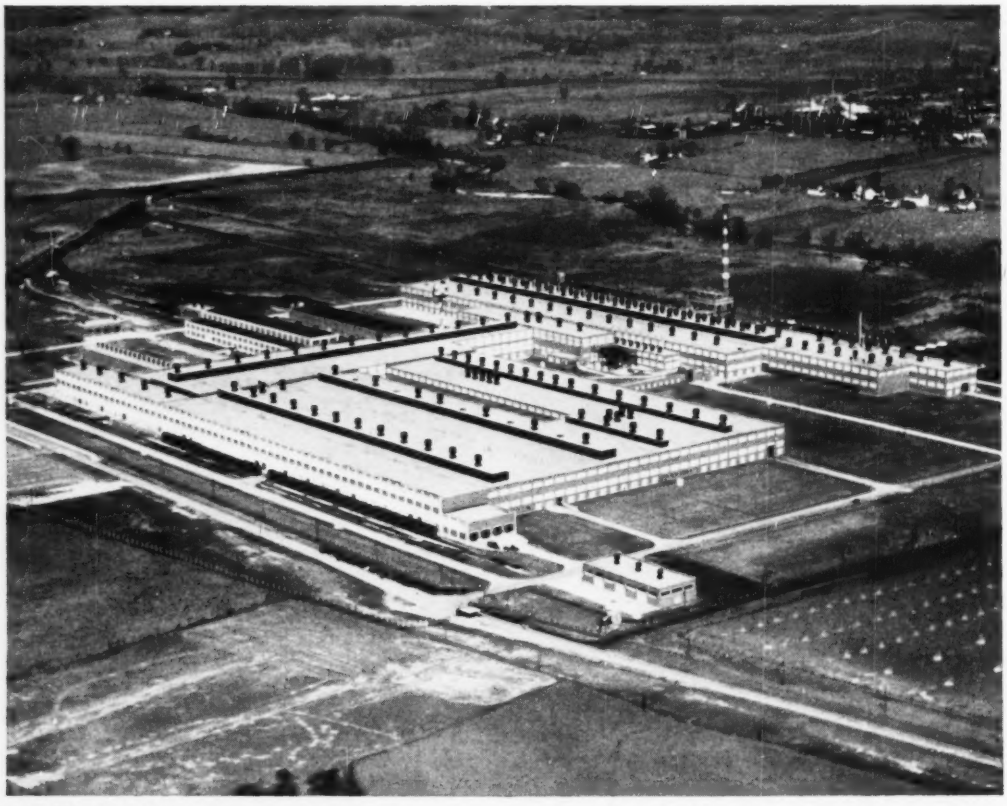
Permanente Metals to produce quality Aluminum Cable Steel Reinforced (ACSR) and Aluminum Cable, in full range of standard sizes.

Permanente Metals has equipped its Newark, Ohio, plant with new wire and cable production facilities to make it one of the most modern in the world. It was built in 1943 for wartime production of rod and bar.

Manned by experienced, highly skilled personnel, it will produce aluminum cable of high quality and uniformity—Kaiser ACSR and Kaiser Aluminum Cable.

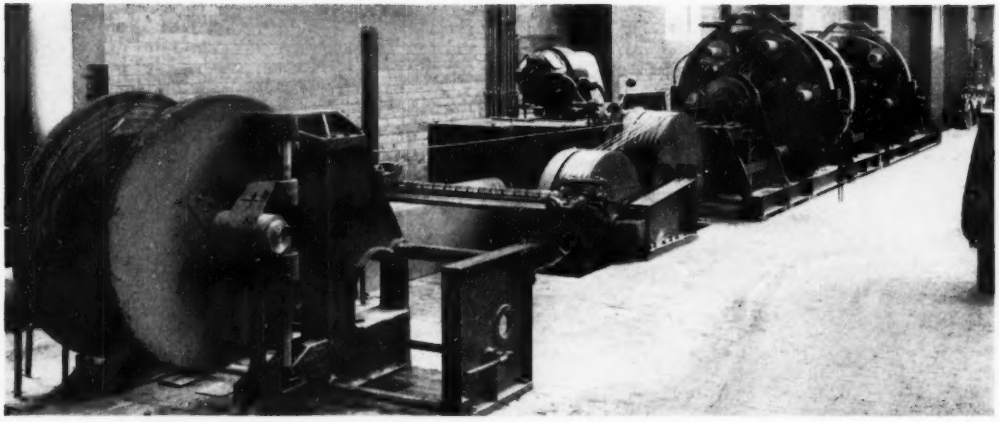
Thousands of U.S. manufacturers in other fields look to Kaiser Aluminum for finest quality—and to Permanente Metals for a brand of service that has set high standards for dependability.

You're invited to do the same! For more information about Kaiser Aluminum Cable, an inquiry to our nearest office will bring an immediate response.



NEWEST ADDITION to Permanente Metals' expanding facilities is one of the world's most modern aluminum rod, bar, wire and cable mills located at Newark, Ohio—where Kaiser Aluminum Cable is produced.

AND ALUMINUM CABLE!

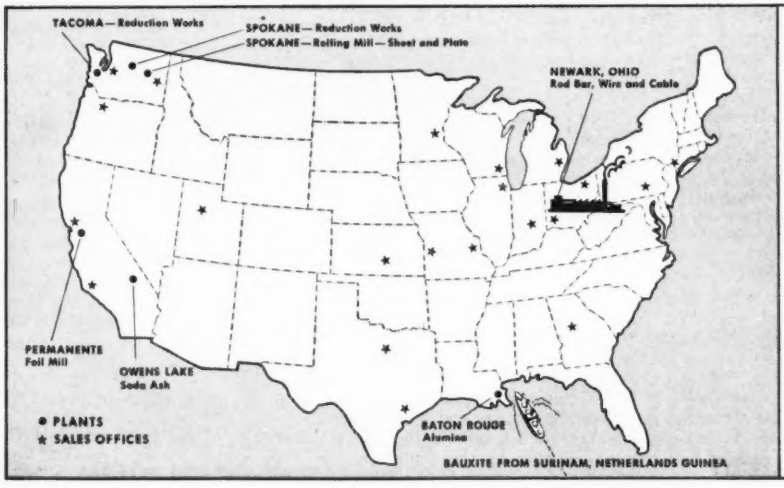


NEW EQUIPMENT now being installed will give Permanente Metals' Newark, Ohio, plant wire and cable production facilities that are unsurpassed by any in the nation.

Permanente Metals

PRODUCERS OF

Kaiser Aluminum Cable



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PERMANENTE METALS' completely integrated production facilities assure you of a dependable supply of Kaiser Aluminum Cable. Twenty-one conveniently located sales offices provide prompt service.

PANORAMA OF THE PCEA

Edited by A. X. Schilling

Convention Program

IF you are planning to attend this year's annual convention—and who isn't?—here's something important to remember. All reservations at convention headquarters, Hotel Del Coronado, will be made only on the basis of the regular reservation form, which all members will receive by mail during the latter part of April or early in May. So, even if you have already written to the hotel for reservations, remember that you must again request reservations by means of the association's reservation form. Even though you may already have written directly to the hotel committee, it still is necessary to make your reservations via the form sent you for that purpose.

The matter of early reservations is especially important this year, for there are several factors that probably will attract an unusually large number of wives to this year's gathering. For one thing, there's a three-day week-end following the convention, which may encourage many members to bring their wives to the convention and then either remain at Coronado or go elsewhere for the Memorial Day holiday. In addition, the hotel has offered our convention group the advantage of its special convention rates for several days before and after the convention.

Opening the convention with an afternoon meeting this year will be a departure from the custom of recent years and has been planned to be of greater convenience from a transportation standpoint, especially for northern delegates. The opening session will be a general meeting and will feature the president's address by M. G. Sues and talks by Fischer Black, editor of *Electrical World*, and others.

On Thursday morning, May 26, the Administrative Service Section will meet as a unit to hear a group of three speakers, the first of whom will keynote a theme such as "What management will expect of various departments if, and when, the business cycle levels off." The first speaker will be a representative of utility management and he will be followed by an economist who will discuss present-day economic trends. The concluding speaker, a representative of the personnel group, will apply the theme to personnel problems.

On Friday morning, the section will meet in four separate groups: accounting, including treasurers; credits and collections; personnel; purchasing and stores.

The Business Development Section will meet as a unit on both Thursday and Friday mornings. Industrial and commercial topics will be featured on Thursday, and the Friday morning session will be devoted to domestic electrification. Special invitations will be sent to all electrical dealers in the San Diego County area for the Friday morning meeting, which will be of particular interest to them.

The Operating Economics Section will meet on both Thursday and Friday mornings in eight separate groups: steam generation, hydro generation, transmission and distribution, substation, meter, transportation, communications, and safety.

There will be organized luncheons on both Thursday and Friday, featuring speakers and topics of timely interest. Special luncheons for the ladies are planned for both days.

The general sessions on Wednesday, Thursday and Friday afternoons will feature top-flight speakers who will discuss subjects of general interest to all delegates.

In addition to the luncheons planned especially for them, the ladies will find themselves well entertained at bridge, pitch and putt golf, swimming, and a trip around the bay.

An organized trip for delegates and their ladies is being planned for Thursday evening, when a group will go to Tijuana for dinner at the Fronton Club and a visit to the Jai Alai games, said to be the world's fastest game.

The Early Bird Club will again be in operation this year, with valuable prizes going to delegates who are prompt in attending the sessions.

Friday evening the manufacturers, manufacturer's agents and wholesalers will be hosts at a cocktail party, which will be followed by the annual banquet and dance. Dress for the banquet and dance will be formal for ladies, optional for men.

On Saturday morning, at 8 o'clock, the golf enthusiasts will gather at the San Diego Country Club in Chula Vista to compete for the Byllesby Cup, the Pelton Cup, the Addison B. Day Cup and other valuable prizes that will be awarded for low gross, low net, first and second flights and several blind bogey events.

● NEARLY a thousand copies of the illustrated booklet recently published by the Advertising Committee have been distributed to company members. The booklet was published to inform members regarding the activities of the Business Development Section, with particular emphasis on the conference in Fresno last fall, and has been favorably received.

Hawaii

At its annual meeting in Honolulu the Appliance & Radio Dealers Assn. of Oahu elected James Hong as president for the year, with Tad Iwanuma as vice-president; Robert Yamanaka, secretary; W. E. Garrison, executive secretary; and Henry Tam, treasurer . . . The association is sponsoring an "electrical living" letter contest which will run until Nov. 20, with monthly electrical merchandise orders being awarded each month, and a grand prize to be awarded in December.

Cletus Chaussee will head the Electrical Appliance Distributors of Hawaii in 1949, and serving with him will be Glenn G. Geoffroy, vice-president; W. E. Garrison, secretary; L. W. Clifford, treasurer. Welcomed into the organization were the distributing firms of J. E. Breault Ltd., The Coleman Co., and Tommy Kearns Ltd. . . . At a recent meeting of the group John Miguel, International Division, RCA, presented a talk on the mainland's upward trend in television and the dropping off of the conventional-type radio.

Institute of Radio Engineers

Television will be featured at the Third Annual Spring Technical Conference on April 23, which is being sponsored by the Cincinnati Section of the Institute of Radio Engineers.

Get CORRECT CONDUIT CONNECTIONS

The easy economical way

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• NEATER • STRONGER • FASTER • APPROVED

Select the best, insist on Briegel All Steel Fittings, the original approved Indenter type connectors and couplings for thin wall conduit tubing. You will not only find that Briegel Indenter Fittings are easier and faster to use, but also make neater, stronger connections, the correct connections. Two Easy Squeezes and they're set. Start using Briegel Fittings today. Have more satisfied customers—more profits from each job.

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IES Regional Conference

Because the subjects presented at the two regional conferences of the Illuminating Engineering Society, at San Francisco and Portland, March 3-4 and March 10-11, respectively, contain so much useful information and because space in this issue is not available, a digest of the papers and talks will be featured in the May issue. Suffice to say that both conferences topped former ones in attendance (250 at San Francisco, 155 at Portland) and drew attendance from British Columbia, Washington, Oregon, Idaho, California, Nevada, Utah, and Arizona. T. H. Shepherd, Los Angeles Department of Water & Power, South Pacific regional vice-president, and Eric E. Ackland, Lighting Materials Co., Vancouver, B. C., Pacific Northwest regional vice-president, presided at the respective conferences, with session chairmen: S. H. Hazelton Jr., Tom Esling, L. W. Towner and H. H. Robison, at San Francisco; R. E. Lange, A. E. Simpson, David Mozes, Ken Hollingsworth and T. W. Fitch at Portland. John S. Walsh, Pacific Gas and Electric Co., was general chairman at San Francisco, with a committee consisting of Dan M. Finch, Gordon Black, A. C. Anderberg, C. T. Bakeman, George Smedberg, and Harry McMasters. Jerry Collins, Portland General Electric Co., was general conference chairman at Portland, with the following committee: Leo E. Chaffin, W. E. Potter, A. H. Griesser, J. Dan Webster, C. D. Ham, T. W. Fitch, Paul Nordstrum, D. O. Bergey, Sam Sposito, Louise Gronnert. President Lee Tayler, Detroit Edison Co., addressed both conferences and held meetings with the boards of managers of the several chapters and sections during his stay to discuss IES policy and program. Reports of the papers presented by national and local speakers will appear next month in some detail.

Pictured at the IES regional conference in Portland, Ore., Dr. Darell B. Harmon, Mike Henkel, President Lee Tayler and Conference Chairman Jerry Collins

IES

Symposium on school lighting was the main feature of the joint meeting of the Mother Lode Chapter, Illuminating Engineering Society, and the Central Valley Chapter, American Institute of Architects, held on March 10 in Sacramento. Dr. Charles Bursch, head of the state division of school house planning, spoke on the need for proper planning of schools. John Walsh, chief illuminating engineer of Pacific Gas and Electric Co., and Doyt Early, architect of the state division of schoolhouse planning, showed slides of tests they had made of lighting conditions in classrooms, pointing out the problem confronting architects and lighting engineers of eliminating brightness contrasts.

Utah Chapter members of IES heard about cold-cathode application from John Ford, vice-president, Electrical Products Consolidated, Seattle, at a recent meeting in Salt Lake City.

Bill Brown, chief pilot, Southwest Airways, who has flown more "zero-zero" landings than any commercial pilot in the West, told Southern California Section IES members, 125 of them, of his experiences in landings at Arcata where a number of lighting systems have been tried. James Read, CAA regional administrator, told of CAA's interest in the problem. Tom Tucker, Los Angeles airport engineer, explained the FIDO fog dispersal installation going in by late March and demonstrated the burners. Various makes of aviation lighting equipment were displayed in the CAA regional office. Aviation committee, headed by Roy Dahlin arranged the program at the airport . . . Members were invited on Mar. 7 to a special program at Edison auditorium to hear G. B. Buck II, F. Glenn Hagadorn, and J. Walt Howard of G-E Lamp Department present regional conference highlights.

"What *is* good lighting for classrooms?" a concise 8-page booklet, has been prepared and printed by the Southern California Section, Illuminating Engineering Society school lighting committee and is receiving remarkable response. Requests for quantities of the illustrated pamphlet have been received by the section from other chapters and sections throughout the country. It was financed by contributions from manufacturers and utilities in southern California and was designed for distribution in that area only. Mailings of it have been made to all school officials, school nurses, PTAs and later will be made available to teachers. Requests came as a result of mailing copies to all sections and chapters of IES. Copies are being supplied at cost of publication. The committee preparing the booklet consisted of Thomas A. Esling, Southern California Edison Co.; Ralph Crump, then with University of California at Los Angeles and Barney de Ramus, Hollywood Wholesale Electric Co. First pages contain 20 questions by which a school can rate its classroom lighting. Next two give suggestions and recommendations. Next come typical classroom plans, and finally fixture types.

Electrical Inspectors' Assn., B. C.

L. H. Miller, city electrician at Vancouver, B. C., has been re-elected president of the Electrical Inspectors Assn. of British Columbia. Lance Robson, provincial electrical inspector, will serve as vice-president and J. Walker as treasurer. R. Hall, manager of the Electrical Service League of British Columbia, will continue as secretary of the organization.

BCESL

Howard N. Walters, general sales manager of British Columbia Electric Railway Co., Vancouver, is the new president of the Electrical Service League of British Columbia. A. E. Grauer, president of B. C. Electric, has been elected honorary president of the league with W. W. Foster of B. C. Power Commission, vice-president; G. L. Haszard, honorary treasurer, and H. L. Horsman, honorary secretary. R. Hall will continue as secretary-manager.

Large Utility Company

Cuts Cable Installation Costs up to 50%

. . . and gets 10% greater current carrying capacity!

For its recently built new boiler and turbine room, a well-known electric utility company chose to wire the installation with ROCKBESTOS A. V. C. spiral armored multi-conductor power cables.

Experience in its old plant had taught this company that the cost of installing interlocked armored cable is less than one-half that for cable in conduit.

Moreover, current carrying capacity of 3-conductor spiral armored cable is safely indicated to be 10% greater than three single conductors in conduit with normal occupancy.

Material, time and labor savings like these can be yours.

And they can be more dependably yours when you specify ROCKBESTOS A. V. C. — the original cable with the *permanent* insulation of impregnated felted asbestos.

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WIRES and CABLES by

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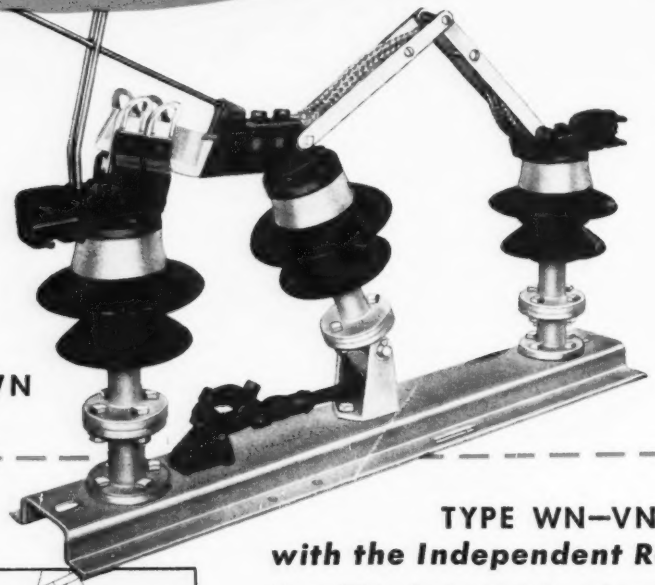

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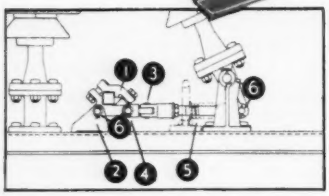

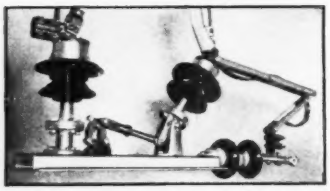

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TYPE WN—VN
with the Independent Rockershaft

Chance Tilting Insulator Switches make positive contact on all phases because the Rockershaft operates independently of the tilting insulator. Not affected by angular distortion . . . each blade in a three-pole switch makes a complete contact without affecting the other two blades.

- **EASILY INSTALLED AND ALIGNED** . . . Removable clamps (1) permit shaft to be laid in position after switch units are mounted. Rockershaft base (2) pivots to aid alignment with operating shaft. Pivot base and universal joint (3) compensate for warpage of supporting structure.
- **POSITIVELY NO SLAMMING** . . . Special toggle joint (4) prevents slamming of blade when closing.
- **EXTRA LEVERAGE** of Rockershaft gives smooth, easy operation with ample power to break ice accumulation. Bumper spring (5) cushions operating movement and helps start closing motion.
- **NO OILING** . . . All working joints are fitted with Oilite bearings (6) for smooth, lifetime operation.
- **UNIVERSAL TERMINALS** . . . Reversible switch terminal blocks accommodate cable ranging from No. 4 solid copper to 600,000 C. M. or ½" and ¾" I. P. S. tubing.

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Switching Equipment

Side and Center Break
7.5 through 230 Kv.

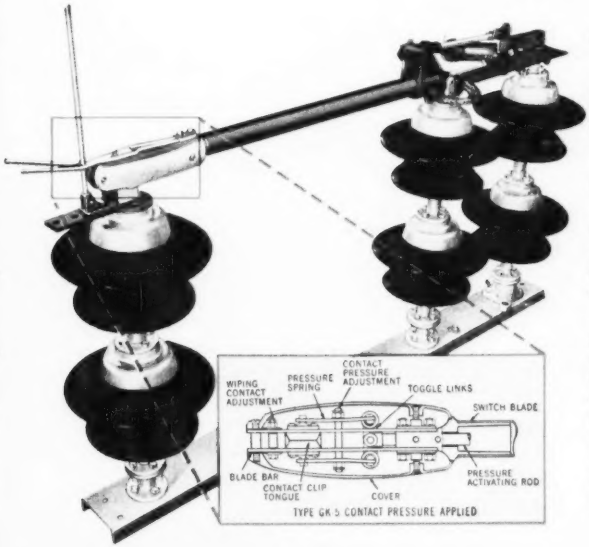
Designed primarily for use on installations where phase spacing or operating room is limited.

● **EASILY OPERATED** . . . Insulator stacks, driven by crank and link mechanism, rotate in opposite directions to open the switch with a shearing action that easily breaks ice accumulations.

● **SILVER-INLAID, PROTECTED CONTACTS** . . . Non-ferrous housing provides corona shielding and sleet protection for contacts. Heavily silver-plated blade produces low resistance contact. Contact springs, out of current path, maintain positive pressure.

Type XX Center Break Switches range from 46 through 230 Kv. Type X Side Break Switches range from 7.5 through 115 Kv. Both range from 400 through 1200 Amps.

TYPE XX



TYPE GK-5 CONTACT PRESSURE APPLIED

TYPE GK-5
For Sub-Station and Line Disconnect Service up to 287 Kv.

● **LARGE AREA CONTACTS** provide maximum thermal capacity.

● **SILVER CONTACT SURFACES** maintain lower contact resistance by preventing copper oxidation.

● **CONTACTS WIPE CLEAN WITHOUT ABRASION** . . . Blade and clip contacts engage with gentle wiping action that cleans surfaces without abrasion.

● **HIGH CONTACT PRESSURE APPLIED AFTER CLOSING** . . . High pressure is attained between blade and clip by the final movement of operating mechanism. This pressure is attained without abrasive movement between blade and clip contact surfaces. Contact pressure is released *before* blade moves in opening operation.

Diagram shows Type GK-5 contact mechanism. After closing motion is completed, cam-actuated control rod causes toggle links to expand against the leaf springs and transmit high pressure to the contact surfaces.

RIGHT when you specify

IAEI

Decision as to dates for the usual series of annual chapter meetings of International Association of Electrical Inspectors in Denver, Salt Lake City, Idaho Falls and Great Falls had not been made at press time. Montana Chapter decided to forego its meeting to concentrate on the annual Northwestern Section meeting in Butte in October. Tentative dates had been set for Denver, May 5-6; Salt Lake City, May 9-10; Idaho Falls, May 11; Portland, May 13; in order to accommodate Charles Smith, IAEI secretary, on his way to the NFPA Electrical Section annual meeting in San Francisco May 16-19. However, the Salt Lake City dates conflict with the Business Development Section, Northwest Electric Light & Power Assn. in the same city. Northern California Chapter planned a joint meeting with Central California and Greater Central Valley Chapters at Santa Cruz, May 21; Southern California Chapter at Long Beach on May 25. Smith would attend each of these also.

Two new chapters of the Southwestern Section have been chartered. Honolulu Chapter was formed recently. John Thomas Carey, Honolulu city inspector, was elected chairman; Joe Joaquin, secretary-treasurer. Arizona chapter was organized in January and chartered March 12 at Phoenix. Frank Jones, Arizona Rating Bureau, is chairman. G. C. Lawton, secretary.

A new chapter of the Northwestern Section, International Association of Electrical Inspectors, was set in motion at a dinner meeting in Portland, Ore., March 11; 36 local members of the association met at the call of O. T. Fugit, city electrical inspector, adopted by-laws, elected officers and accepted committee appointments. The chapter which will embrace the entire state of Oregon will be called the Oregon Chapter. Application for a charter will be made immediately.

O. T. Fugit was elected chairman; James Vernon, state electrical inspector, vice-chairman, and Paul Miller of the Portland inspection department, secretary-treasurer. The following were elected to the executive committee: M. L. Glenn, Pacific Power & Light Co., and Jack Krauser, Portland contractor.

The newly elected chairman immediately appointed a publicity and membership committee, with Cliff Atkins, state electrical inspector, chairman, and the following members: J. B. Kennedy, Pacific Power & Light Co.; R. G. Smith, contractor, and C. E. Bauer, East Side Electrical Supply Co. A fact finding committee is headed by Chris Klawa, city electrical inspector.

Next meeting will be April 8, when the program will take the form of a discussion of the new state law regulating electrical contracting and appliance selling.

Puget Sound Chapter held its quarterly meeting, March 5 at Everett, attended by 86. Ray Larrabee urged setting up code panels similar to those to be set up by the NFPA. C. S. Alger told of comparative costs of electric house heating and the serving problem posed for the utility. Code discussion centered on whether water and sewage systems should be bonded to eliminate hazardous differences of potential under certain conditions. Next meeting will be in Bellingham, June 4.

Discussion at both Northern California and Southern California chapter meetings, March 19 at Alameda and March 23 at San Gabriel will be reported next month.

EMEA

New constitution of the Electrical Maintenance Engineers Assn. of Northern California has been adopted. Report on safe practices in gas welding was given by Henry L. Pohndorf, National Welding Equipment Co., San Francisco, at its recent meeting.

IEA

Henry Richards, assistant manager of Granite Furniture Co., Salt Lake City, will head the retail division of the Intermountain Electrical Assn. for this year, succeeding Robert Nevin. C. W. Gilner was elected vice-president. Carlos Stone is secretary-treasurer of the association . . . Parky Hale, Utah State Trade Commission, explained operation of the Fair Trade and Unfair Practices Acts and declared many to be violating the "selling below cost" provisions of the latter, to Salt Lake City, Price, and other chapters of IEA.

Willard Hellman of Montgomery-Hellman, Los Angeles, has been elected president of the Southern California Radio & Electrical Appliance Assn. for 1949, succeeding Marshall C. Wells. Serving with him will be James J. Kerwin, vice-president; Howard K. Burdick, secretary; and Sam Elster, treasurer.

Contractors

All contractors interested in line construction were invited to a special meeting in San Francisco called by E. R. Cornish, director, Pacific Coast office, National Electrical Contractors Assn., April 2-3. One day would be a meeting with International Brotherhood of Electrical Workers officers to try to arrive at working conditions and rates that would permit contractors to meet competitive conditions and to settle jurisdictions.

District 8, comprising the Mountain States, planned a NECA district meeting in Denver, May 6-7. District 6, the Pacific States region, planned its district meeting in Spokane, May 22-24.

East Central California Chapter, NECA, is now official. Its territory covers the San Joaquin Valley south of Merced. Noyes Alexander has been appointed manager with offices in the Builders Exchange, Fresno. Bill Ochinero is president, John Caglia, secretary-treasurer; the governor has not yet been decided upon.

Peninsula Electrical Contractors Assn. celebrated its anniversary and honored its newly elected officers at a dinner dance at Villa Chartier, last month. President is Louis Rolla, vice-president W. T. Kennedy, treasurer Joseph Dingman, Manager is W. J. Varley.

AIEE

Modern electrical apparatus in the steel industry was the subject of a talk given by G. E. Stoltz, consulting engineer, Westinghouse Electric Corp., at the Seattle Section meeting of the American Institute of Electrical Engineers in March.

NWPPA

At its recent Portland meeting, the Northwest Public Power Assn. passed the following resolution (not included in last month's report of the session): Resolved that:

The Congress authorize by statute a long-range integrated construction program which would adequately provide for power generation and transmission, navigation, flood control, irrigation, wildlife and recreation needs of the Pacific Northwest;

The Congress provide by statute a long-term financing program for such a construction program, such financing plan to be developed on a sustained basis, so that funds will be available at a rate and volume commensurate with the most efficient development of the program so as to meet growing electrical loads;

The Congress authorize by statute the application of modern management methods on Columbia Basin development so that the program can be planned and operated on a coordinated basis;

The Congress make provision for the maximum degree of local participation and home rule within the region;

That the board of trustees of the Northwest Public Power Assn. be authorized to examine any proposed legislation to effectuate the preceding proposal and to endorse or take exception to any part or all of such proposed legislation.

By vote of the membership it was decided to hold the annual summer meeting of the association in Tacoma sometime during September.

Yes-we have a fountain of youth

ONE of those early explorers came to America to find a Fountain of Youth. But he never found it. We, on the other hand, have never looked for a Fountain of Youth—but we have found one.

The way we look at it, a company exists only so long as it serves the needs of its customers. When it falls too far behind, it fails. That is part of the American tradition of Free Enterprise.

Kerite customers have brought their problems to us for 90 years. And we have done our best to solve them. That keeps us young. And it keeps our customers coming back. As long as people do bring us their problems, we have a Fountain of Youth. We think that is as it should be. We will continue solving problems just as long as we can.

One problem that was solved a long time ago was that of developing an insulation that would stand-up-no-matter-what. Mr. A. G. Day solved that one back in the 1860's when he developed Kerite. We can show you samples of Kerite cable more than 50 years old that are still in first-class condition! The Kerite we build today uses the same formula. It is just about the longest-lasting, most economical insulation around. It stays young, too! The Kerite Company, 30 Church Street, New York 7, N. Y.

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YOU CAN BE SURE.. IF IT'S
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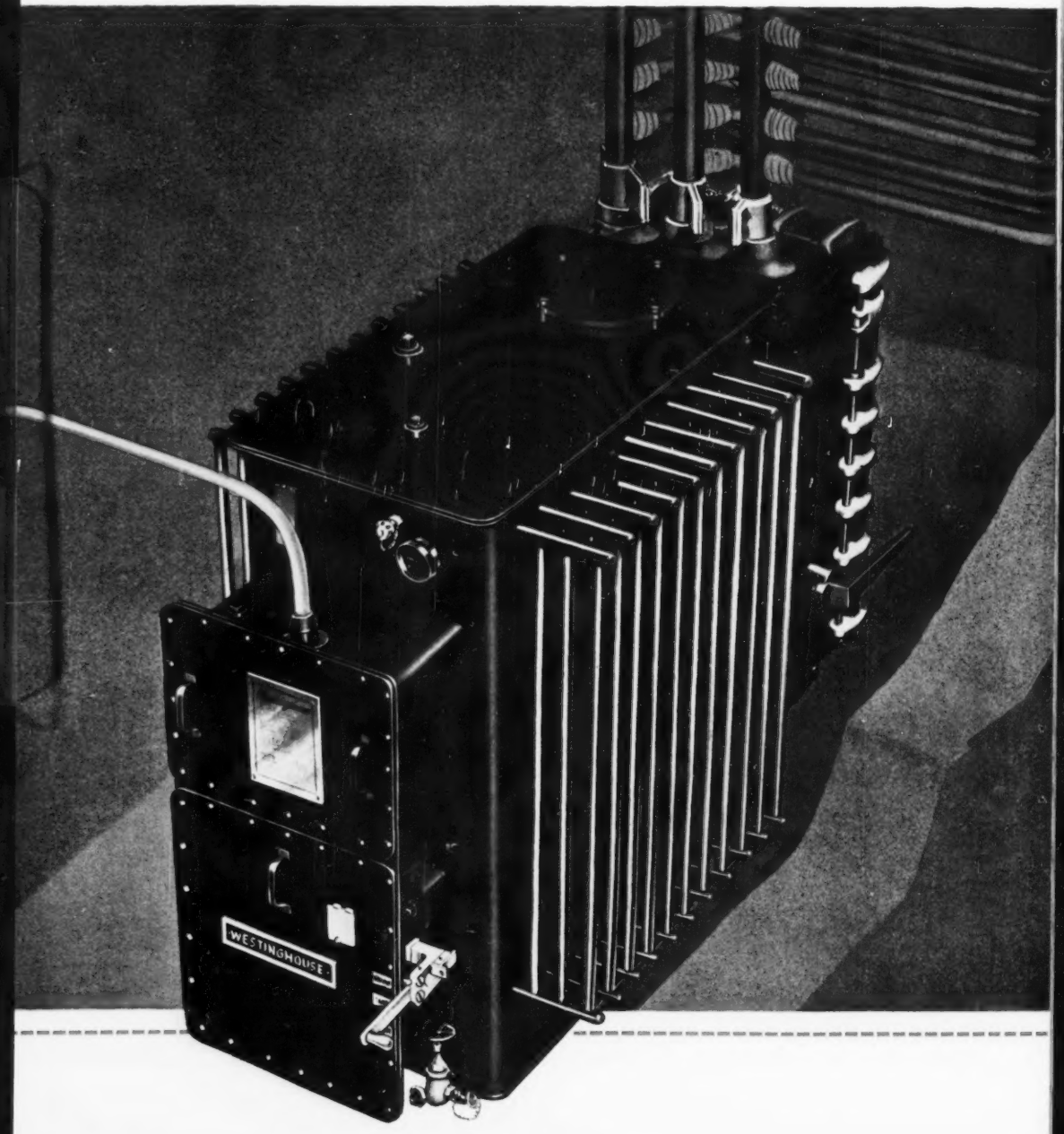


Now you can lower network costs with a Westinghouse STANDARD-TYPE transformer

New Features, New Ratings, New Service in Standardized Designs

The new Westinghouse Network Transformers are designed to make the use of standard units both practical and economical. Now you can eliminate individual engineering and meet your needs better than ever before.

The many "plus" features of Westinghouse standard-type, liquid-filled Network Transformers include:

Liberal Clearances between conductors to insure continuity of service;

Continuous Windings with sliverless copper;

Welded Cover providing Sealedaire dependability;

High-voltage Terminal Chamber with ample space for making cable connections in low vault;

Low-voltage Bushings that can be replaced without removing cover;

Undercoating of base to reduce maintenance and lengthen life.

In addition, you can stock standardized parts; delivery time is reduced to a minimum; and cost is less because the engineering has already been done. And now, two new standard ratings—150 and 225 kva—give you all the advantages in six liquid-filled units from 150 to 1,000 kva.

Westinghouse leadership, which developed network distribution and is constantly pioneering improvements, offers a sales and engineering service to assist you in applying the transformers for maximum service and economy both for enlarging established systems and in new applications.

Transformer engineers are always at your service via your nearest Westinghouse office. Write for B-4082 to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-70528

THE SAFEST TRANSFORMER EVER BUILT!

Yet another step forward in network distribution is the new Westinghouse STANDARD SUBMERSIBLE DRY-TYPE Transformer. No liquids to leak, burn, explode, fume or require attention; built with Class H insulation; sealed nitrogen-tight by welding.

The Westinghouse Network Transformer line, to which this unit is the latest addition, also includes:

STANDARD VENTILATED DRY-TYPE units, for use where not subject to submersion;

STANDARD LIQUID-FILLED units (oil or Inerteen) for submersible service.

Westinghouse

NETWORK TRANSFORMERS

NCEB

Harry Jackson of Jackson's, Oakland, has been re-elected president of the Northern California Electrical Bureau, according to announcement following the annual meeting in San Francisco, Feb. 24. Other officers and directors follow:

Vice-president, A. H. Meyer, Leo J. Meyberg Co.; secretary, O. R. Doerr, Pacific Gas & Electric Co.; treasurer, Frank K. Runyan, Western Merchandise Mart; chairman, executive committee, John S. C. Ross, Pacific Gas and Electric Co.

George W. Abbett, Abbett Electric Co.; W. B. Baker, San Francisco Electrical Contractors Assn.; Fred D. Benz, Fred D. Benz Co.; I. W. Borda, The Okonite Co.; Wallace E. Breuner, John Breuner Co., Oakland; C. D. Bronson, Alameda County Electrical Contractors Assn., Oakland; Ralph Brown, Retail Furniture Assn. of California Inc.; Roy M. Butcher, Roy M. Butcher, San Jose; Edgar L. Buttner, Scott-Buttner Electric Co., Oakland; J. P. Carson, Graybar Electric Co.; Clyde L. Chamblin, California Electric Construction Co.; H. H. Courtright, Pacific Gas & Electric Co., Fresno; George S. De Bonis, City of Paris; D. J. Desmond, Sterling Furniture Co.; P. M. Diederich, L. Lion & Sons Co., San Jose; O. R. Doerr, Pacific Gas & Electric Co.; George Egleston, H. R. Basford Co.; John Elwood, National Broadcasting Co.; Frank Falge, General Electric Co., Oakland; Fred S. Fenton Jr., Easy Washing Machine Corp.; C. J. Franke, Franke Electric Co., Stockton; Charles W. Goodwin, General Electric Supply Corp.; Robert C. Gray, Remler Co. Ltd.; Gayle V. Grubb, American Broadcasting Co.; Marshal Hale Jr., Hale Bros. Stores Inc.; Harry Jackson, Jacksons, Oakland; Marvin Jankelson, Incandescent Supply Co.; Allan Jones, General Electric Co.; W. J. Lee, Sherman Clay & Co.; C. R. Matthews, Westinghouse Electric Supply Co.; A. H. Meyer, Leo J. Meyberg Co.; Obert Pedersen, Pedersen Furniture Co., Santa Rosa; Fred H. Pelle, Wisnom Hardware Co., San Mateo; B. W. Reynolds, General Electric Supply Corp.; R. E. Robertson, Frigidaire Division, General Motors Corp.; T. L. Rosenberg, National Electric Contractors Assn. Inc., Oakland; John S. C. Ross, Pacific Gas and Electric Co.; Frank K. Runyan, Western Merchandise Mart; K. M. Ryals, Ryals Electric Co.; LeRoy Smith, California Retail Hardware Assn.; R. S. Sloan, Westinghouse Electric Supply Co.; Louis D. Stull, Apex Rotarex Corp.; J. F. Sullivan, Dohrmann Commercial Co.; N. R. Sutherland, Pacific Gas & Electric Co.; George C. Tenney, McGraw-Hill Co. of California; W. H. Thompson, Westinghouse Electric Corp.

The bureau has named the following executive committee and section chairman members to serve during the coming year: John S. C. Ross, chairman; Fred D. Benz, chairman, Wiring Section; W. H. Thompson, chairman, Lighting Section; A. H. Meyer, chairman, Radio and Television Section; R. S. Sloan, chairman, Appliance Section; George C. Tenney, chairman, Education Section; R. E. Robertson; Fred S. Fenton Jr., and B. W. Reynolds.

Electric Clubs

Sacramento Electric Club has changed its name to Sacramento Electrical League in order that it can work in closer cooperation with the International Association of Electrical Leagues . . . Report on adequate wiring and the league's activities in certifying adequately wired homes was given at a recent meeting by G. L. Cane, secretary. Speakers on the program were F. M. Sandusky, manager of the Sacramento Home Exposition, who outlined his plans for the second annual show to be held in May. T. C. Bakeman described the Sight-saver and Vision-aid line of lighting adaptors for residential lighting.

Sales training program sponsored by the Sacramento Electrical League, the Northern California Electrical Bureau and the State Department of Education, started in February and continued through March. First in the series was devoted to selling of electric ranges. Meetings may be repeated.

Joint meeting of the Portland Electric Club with the Illuminating Engineering Society was the occasion of the Third Pacific Northwest Regional Conference of IES members from Oregon, Washington, Idaho, Montana and British Columbia. National president of IES, Lee Tayler, as guest speaker, talked on the IES and the electrical industry.

Pointers on selling in a buyer's market were given by Dr. Paul W. Ivey, professor of merchandising at the University of Southern California, at a recent luncheon meeting of the Electric Club of Los Angeles . . . The following week Don P. Caverly, director of commercial engineering, Sylvania Electric Products Co., told members that the job of the electrical lighting industry is to educate architects in problems of lighting, and help them choose the kind of lighting that will best do the job. Caverly amplified his talk with color slides showing modern and effective store lighting; also supplied guests with a booklet *Color Is How You Light It.*" . . . On March 14, General Electric Day, members were told what the industry is doing in developing pioneers for the frontiers of engineering, by Ernest E. Johnson, manager of engineering for the apparatus department of General Electric.

Annual meeting of East Bay Electric Club and East Bay Engineers Club on March 7 featured as guest speaker, Lester E. Reukema, professor of electrical engineering, University of California, on the topic of atomic research and its practical applications.

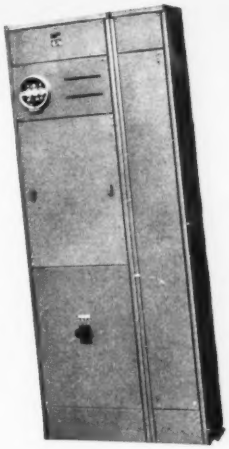
Westinghouse engineer, G. E. Stolz, who recently returned from Europe, where he has been working on problems connected with France's steel industry, gave first-hand information on the French economy to Electric Club members of San Francisco recently. Proper exploitation of France's iron ore will enable production of sheet steel which can be used in the manufacture of many other needed products, said Stolz . . . Following meeting featured the inauguration of the club's new president, D. D. Smalley, and other officers.

At the San Diego Electric Club meeting on March 15 members saw the *Watts in Glass* color movie, produced by Owens-Corning Fiberglas Co.

Lighting Awards

Although no "gold seal" merit awards were made this year to Westerners in the competition of the third International Lighting Exposition, Chicago, March 29-April 1, there were many who received merit awards in each classification. Robert E. Bennett, electrical engineer, received a merit award with distinction for stadium lighting in Pasadena. Other award winners were: *Utility lighting representatives*—Warren B. Smith, So. Calif. Edison, Pomona bowling alleys; John G. Oliver, same company, Huntington Beach, restaurant; Sam W. Stewart, Montana-Dakota Utilities, Miles City, Mont., club dining room; Warren W. Weiss, PG and E. San Francisco, club room; A. Anderberg and C. J. Wood, PG and E. San Francisco, office; *Contractors*—R. H. Fewell, Westinghouse Electric Supply Co., and B. L. Payson, Wire Electric Co., Tacoma, auto repair shop; Leonard Carlon, Sturgeon Electric, Denver, bank accounting department; *Architects and engineers*—John Kiger, Bunnell & Marque, Spokane, men's clothing store; Kenneth S. Wing, Long Beach, women's apparel shop; *Wholesalers*—R. H. Fewell, Westinghouse Electric Supply, Tacoma, and B. L. Payson, Wire Electric Co., Tacoma, showroom; F. A. Dunn, General Electric Supply, Denver with Leonard Carlon, Sturgeon Electric, Denver, clubroom; *Owners and Users*—Martin Livingston, San Francisco, clothing store.

MAXIMUM FLEXIBILITY with STANDARDIZED SWITCHBOARDS



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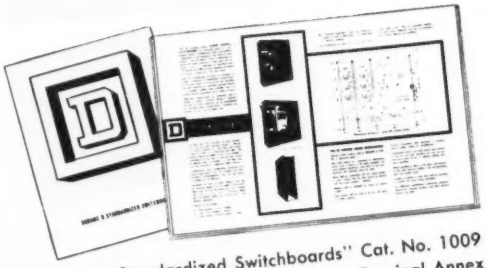

Square D Standardized Switchboards are manufactured in sections of a number of standard widths. The height of sections is uniform. The combinations of various sections make a complete switchboard for varied uses in a sturdy, attractive, space-saving enclosure.

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THE MONTH IN BRIEF

Large CVP Appropriation Expected

As this issue went to press, indications from Washington, D. C., were that the House will approve $53,550,000 for fiscal 1950 work on the Central Valley project. The House appropriations committee indorsed the broadest program to date within the project: approved the USBR program for a Delta steam plant, west side transmission lines and the Elverta switchyards, most controversial of bureau plans for the CVP. The committee approved a lump-sum appropriation, asked by the bureau. In past years the CVP funds have been earmarked for irrigation, joint facilities and power. Representative Harry Sheppard (D., California) sponsored an amendment in committee to restore the earmarking system and eliminate the three controversial power features but it was defeated 17 to 14. He said he did not intend to offer the amendment on the House floor.

Combined Bills Pass in Washington

House bills 270 and 322 (EWEST, March, p. 110) establishing a Washington state power commission and permitting two or more PUDs to acquire jointly an entire private power system were combined with a third measure providing PUD "in lieu" payments to school districts with bond indebtedness, and the combination bill was passed by the state legislature. Governor Langlie, an advocate of the commission plan, signed the bill. Both 270 and 322 were buried in the senate public utilities committee until backers of the commission plan agreed to support the PUD bill in exchange for support on the commission plan. Opposition to the bill's passage claimed it would put every private utility in the state out of business inside of two years. Backers of the commission plan justified their support of the PUD purchase plan by expressing the belief that the fight between private and public power is over in the state and that development and delivery of power is going to be a public operation. A state agency can best resist the growing movement by the federal government to control power, they believe. Howard Aller of New York, president of American Power & Light, holding company for Washington Water Power and Pacific Power & Light, is reported to have lobbied for the bill, while Kinsey Robinson, president of WWP, opposed it.

Commission Appointments Expected

Meanwhile Governor Langlie is expected to appoint the three-man power commission authorized by the bill. The commission will have the power to acquire and operate electrical production and transmission facilities. Its members will have annual salaries of $8,500; an operating appropriation of $150,000 for the next two years. Speaking at the Columbia Basin interagency committee in Pocatello, Idaho, Langlie expressed hopes that Idaho and Oregon would adopt similar legislation. It has been suggested that the new commission conceivably could work with other states in setting up a state-operated development of the Columbia Basin, provided the federal government would sell existing installations. The bill asserts Washington's primary rights to the hydroelectric potential of the state and authorizes the commission to act by itself or in conjunction with other states to retain that right; it also gives the commission authority to negotiate with Canada on power matters, an authority that might not hold up in the courts. Mayor Devin of Seattle has suggested that President Truman be asked to include in the administration CVA bill a clause allowing any state to buy, at cost less depreciation, any power facilities built in that state by the federal government.

Constitutionality Questioned

Contention that the new Washington power law is unconstitutional was made by opponents on the basis that no law may cover more than one subject. Legal advisors of Governor Langlie are said to admit a "question of doubt" on constitutionality but to argue that the bill has one subject: conservation and development of the state's electrical resources. Opponents point to three subjects—authorization for a PUD combine; formation of a state power commission; the "in lieu" payment provision.

Emergency Control Bill Killed

Washington state legislators killed a bill to give the governor absolute emergency control over the state's electric utilities. Opponents pointed out that the proposed commission couldn't do a better job than the Northwest Power Pool did in conserving power during critical periods, and might cause disastrous after effects when the emergency was over.

Now its Ions

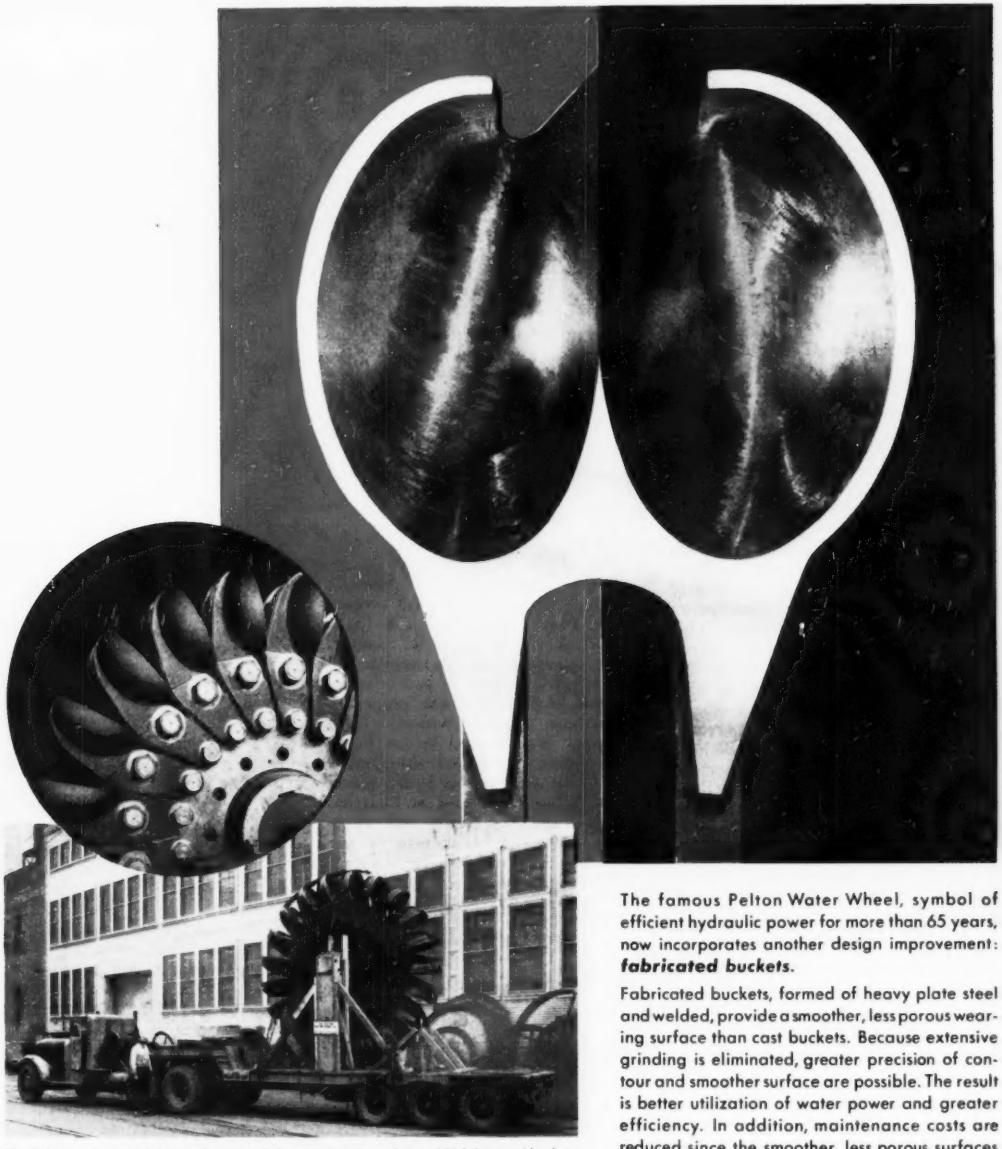
Air used to be just plain old air, but no more. Now it has ions, it seems. Captured German scientific reports reveal that considerable research had been going on to learn what effect ionization had on people, animals, plants and products. Instead of just positive and negative ions it seems there are some 300 varieties. Now Stanford University under the Wesix fellowship is carrying on further work on ions in relation to heating and air conditioning. A woman suffering from acute sinus irritation was given an experimental heater that seeks to shift the balance of ionization as it heats. After using it for a week not only did it help her sinuses but surprisingly, it stopped her husband's snoring.

Sanctuary Bills Fail in Oregon

The Oregon legislature defeated the bill to reserve waters of the Deschutes and Metolius Rivers as fish sanctuaries and passed a bill reducing the portion of the Rogue withdrawn. The former measure would have prevented the construction of the Pelton project (EWEST, February, p. 133). The latter bill moves eight miles downstream the line below which no dams may be constructed on the Rogue. It paves the way for construction by USBR of a $90,000,000 multi-purpose development on the Rogue at Lewis Creek.

WATER WORKS HARDER

WITH NEW PELTON FABRICATED BUCKETS



The Pelton water wheel shown above ready for shipment is made up of 21 fabricated buckets. When installed, this runner will produce 35,000 H.P. at 300 R.P.M. under a 2,200 foot head.

The famous Pelton Water Wheel, symbol of efficient hydraulic power for more than 65 years, now incorporates another design improvement: ***fabricated buckets.***

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THIS MONTH'S NEWS

CITY STARTS DICKER FOR PUGET PROPERTIES

Following receipt of the long-awaited engineers valuation report on Puget Sound Power & Light Co. properties for possible purchase by the city of Seattle, the city council wrote to the company asking whether it is willing to sell its Seattle competitive area system and its Snoqualmie and White River hydro plants.

According to Frank McLaughlin, power company president, the properties are for sale at a price which will include adequate compensation for the very substantial severance involved.

The plan under consideration was plan two in the report made by consulting engineers, Carl D. Pollock Co. of Seattle and Ford Bacon & Davis of New York. Plan one called for purchase of competitive area properties only and a third plan suggested purchase of those properties plus the Rock Island hydro plant. Plan one totalled $25,017,261 in property valuation on a cost-less-depreciation basis; plan two, $35,269,035; plan three, $47,244,238.

The report shows that either plan two or three would give the city slightly more than 100,000 kw. of new power at peak, to meet the 200,000-kw. demand of Puget Power customers. Advantages of the 30,000-kw. Rock Island Dam were outweighed in the report by disadvantages of greater cost; probability of requiring additional generators; right of the federal government to "recapture" the plant in 1980.

The report shows that City Light is doing an annual business of $12,000,000 and that Puget Power's revenues are more than $3,000,000 a year in the competitive area. Electric operating revenues of the combined system under City Light would advance to $25,322,165 in 1952, it is estimated.

City Light's physical and financial program during the next five years, with or without purchase of Puget Power properties, will dwarf those of all past periods, it is stated. If proposed purchases are made, expenditures probably will exced $118,000,000. After meeting operating costs, taxes, depreciation and interest and redemption charges on bonds other than those to be issued for the prospective purchase, City Light, on basis of estimated earnings, would have a five-year (1948-52) net income of $42,945,342 for a cushion, the report indicates.

City Light Superintendent E. R. Hoffman warned, however, against a too-literal acceptance of the engineers' figures, which were based on Dec. 31, 1947 prices.

Meanwhile belief is expressed in Seattle that, with passage of the new power law (p. 118), Puget Power will sell its entire system to a group of PUDs, rather than sell a part to the city and the rest to the districts.

So far, however, Whatcom County PUD has failed to agree with other districts on terms of the sale of properties. Another obstacle is that the bill allowing joint purchase by PUDs does not go into effect until June.

Tacoma May Try to Buy Puget Properties

City of Tacoma last month became a third potential customer for properties of Puget Sound Power & Light when C. A. Erhdahl, utilities commissioner, introduced an ordinance in the city council which would authorize acquisition of certain of the properties by purchase or condemnation.

Tacoma is interested in the Puget Power transmission and distribution lines in the area and in hydro plants on the White River and at Electron. The new law, regarding PUD purchases, as well as failure to receive permission for Cowlitz River developments, are reasons given for the Tacoma action.

Water Users Curtail Pumping Service

Electrical service for pumping has been curtailed by the Salt River Valley Water Users Assn. in the Phoenix, Ariz., area. Pumping has been restricted to five days a week, though nightime pumping will be permitted on the two off days.

Richard B. Searles, president of the Water Users, indicated that power supply will continue short despite encouraging reports of runoffs from winter storms. A 7,800-kw. steam turbine generator is being installed near Tempe and should be on the line by June 1, but this power is budgeted already, Searles said.

RATE INCREASE ASKED TO OFFSET RISING COSTS

A 9% revenue increase or $1,500,000 annually is requested by Utah Power & Light Co. in an application filed with the state Public Service Commission.

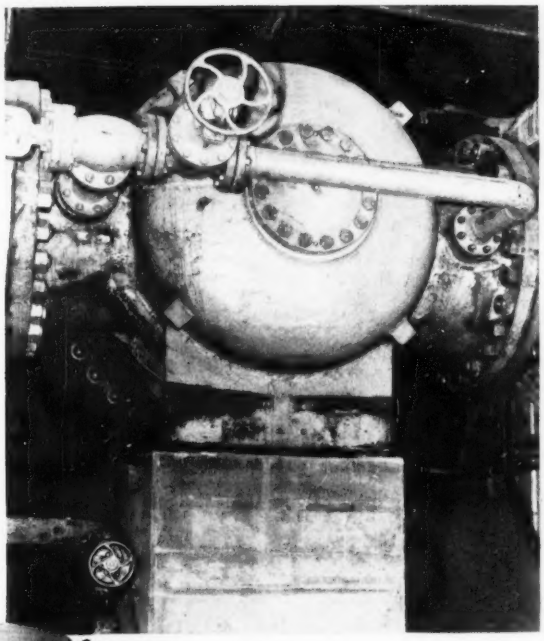
The new rates would become effective in June, giving the company an estimated additional gross revenue of $750,000 for the current year before taxes. The increase would amount to about 2c per day for 99% of the company's residential customers and Utah's average residential user would be obtaining power at 20% less than the national average, according to President George M. Gadsby.

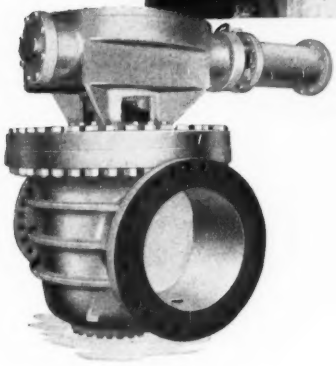
Gadsby said the requested increase is needed to assure adequate electricity for the scores of new industries and people "literally knocking at our doors." The company will have spent some $61,000,000 by the end of 1953 on new facilities. Some $600,000 of the $1,500,000 requested will go to federal and state taxes, he said.

The company application pointed out that, since 1943, its pay roll has jumped 65%, the cost of coal in Salt Lake, 59% and taxes 19%. There has been a 26% decrease in the cost of residential electric service over the same period, the company pointed out.

Co-op Bill Passed in Part

Sections of a bill which would have exempted electric co-ops in Arizona from Corporation Commission supervision were killed by standing vote by the state legislature. After revision the bill still contained two strong points for co-ops: (1) an amendment prohibiting co-ops from serving others than members. This is expected to strengthen contention of co-ops that they are not public utility corporations and thus not subject to jurisdiction of the corporation commission. (2) clarification of the territory which a co-op may serve. Co-ops are expressly prohibited from constructing distribution lines which duplicate existing private power lines or from serving a consumer who already is receiving private power, has been connected to any other distributor or is within a half mile of his lines.





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Cooperation Bests Power Shortage

The question, "How did the Northwest meet its 1948-49 power shortage," can be answered with the one word *cooperation*. Had it not been for the splendid work of the Northwest Utilities Conference Committee headed by C. A. Erdahl, of the city of Tacoma, and the fine public response to reduce load, the results would have been disastrous. The problem faced by the Northwest Power Pool last fall was to meet an estimated peaking deficiency upwards of 175,000 kw. Actually, it developed that the shortage would have reached about 250,000 kw. had it not been for voluntary customer curtailment.

Erdahl's committee was on the executive level and met frequently. Through this committee an agreement was reached under which all power agencies would cooperate in meeting the shortage regardless of federal power contracts that would have protected the public agencies against any shortage. Under the Erdahl policy committee there was a technical subcommittee whose duties were to formulate curtailment plans and set up the machinery for carrying them out. This committee started its work in the spring of 1948, months in advance of the time the shortage period would occur. It was the thorough and effective work of this representative committee that pulled ultilities of Oregon, Washington and parts of Idaho through a most critical situation.

The general plan for meeting the shortage was to employ load molding, by which large industrial customers would shift hours of operation to stay off the 4:30 to 6:30 peak; to have commercial lighting customers cut out all but absolutely essential lighting, and to get residential customers to curtail over the evening peak. Long in advance, industrial customers were lined up; publicity was started; trade groups were contacted and each utility's organization was set up. When curtailment became necessary about Nov. 16, the wheels were set in motion. Paid newspaper advertising and radio spot announcements, along with news stories in the papers and the cooperation of radio stations in repeatedly calling attention to the gravity of the situation, proved most effective.

On Jan. 3, 1949, pool frequency dropped to 59 cycles and the second step in the program became necessary. An urgent S.O.S. knocked 120,000 kw. off the peak in three days' time. By Jan. 10, an energy shortage developed in addition to the peak shortage due to reduced stream flow at hydro plants from abnormal and protracted cold weather. This situation was met by a combination of factors, including reduction in feeder voltage in some cases; curtailment of street lighting and by further curtailment by commercial and residential customers. There also was some deferment of industrial stockpiling and the same cold weather that reduced stream flow also caused shut down of building operations and some loss of industrial load—all compensating factors that reduced energy consumption. Finally on

Diogenes with J. B. Buman of Pacific Power customer relations department

Feb. 23, it became possible to lift all restrictions and the winter's troubles were at an end.

Some Figures

Maximum load on the western part of the pool occurred on Jan. 4. On that date the instantaneous peak was 3,163,000 kw. Hourly peak was 3,138,000 kw. At that time it is estimated that curtailment had reduced the peak by about 250,000 kw. over what it would have been under normal conditions. This does not include 81,000 kw. of interruptible aluminum load which was kept off the peak. It is estimated that the 250,000 kw. was made up as follows: 35,000 kw. of interruptible industrial load; 150,000 kw. by industrial load molding; 50,000 kw. reduction in commercial and residential load, and 15,000 kw. that was pumped into the pool by industrial plant generation.

It must be stated, too, that eastern members of the pool, Idaho Power Co., Utah Power & Light Co. and Montana Power Co., came to the aid of the West with all they could spare. There were many times when the Washington-Montana 110-kv. ties carried 100,000 kw. to the West. Too much cannot be said for the fine work of the coordinating committee of the Northwest Power Pool and of the splendid job of scheduling and dispatching done by system operators. Steam plants of the area had to be operated for all that could be gotten out of them. By the time the crisis was over in February it is estimated that three quarters of a million barrels of oil had been burned. Much of this was used in inefficient and obsolete steam plants with costs of two to three cents a kilowatt-hour.

Sidelights

There were many interesting sidelights to the curtailment program. One that received considerable publicity and proved of psychological benefit in the Portland area was a stunt used by merchants of the Hollywood section of that city. Cooperation was sagging and the Pacific Power & Light Co. went to the area's merchants' association with an urgent appeal. The association then went all out. They raised $300, hired a man and dressed him as Diogenes and had him patrol the business street at 4:30 each afternoon, ringing a bell and calling out to signal the curfew hour. The Hollywood Boosters' Club bought 120 war assets lanterns for $1.03 each and hung them in each store entrance to capitalize on adversity. Action of these merchants served to impress the entire city of Portland with the urgency of the power curtailment program.

Thus, the Northwest got through its 1948-49 critical power shortage period without loss of industrial production and without serious inconvenience to the public. Permanent relief for the area's tight power situation is not in sight for another three to four years. With three more 108,000-kw. generators to go into service this year at Grand Coulee, and with some private utility generation scheduled, it is anticipated that the winter of 1949-50 will see an energy shortage rather than the peaking deficiency of the past year.

● AMENDMENTS made to the electrical inspection act in British Columbia were expected to go into force around the beginning of April to permit the regulating of licenses of electrical contractors, according to Lance Robson, provincial electrical inspector. Robson has appointed L. Handy, a member of his staff, to make a survey of licensing forms used in other provinces, while W. E. Lappard, another member of the provincial electrical staff, is surveying the permit system in effect elsewhere.

"WASTE NOT, WANT NOT." Here, truly, is a seasoned proverb for this age of universal electric power... made to order for modern, streamlined production that *demands* old-fashioned thrift. Ask your plant power engineer, consulting engineer, electrical contractor or utility power salesman about the extravagance of overloaded, overextended, obsolete, *inadequate* wiring... and the threat of slow-downs and shut-downs that hangs over your head.

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New R&S EVER-LOK Catalog
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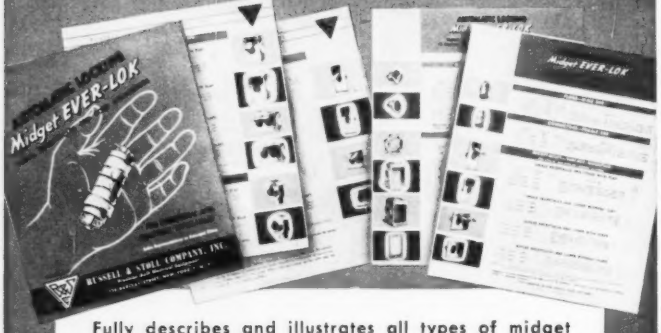

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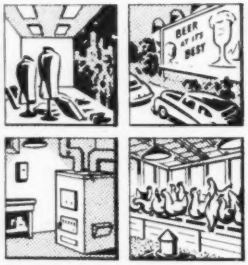

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30 HOUR SPRING RESERVE.
TORK CLOCK CO., Inc.
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Safety Lighting at San Diego

Safety lighting is to be installed on Cabrillo Freeway, San Diego, Calif., by the State Division of Highways. Plans being prepared call for 100 mercury-type lights for all intersections.

The freeway was completed last year and is said to be one of the most modern in the country, but work did not include street lighting and there have been a number of night accidents at intersections since the project was built.

Plans were drawn up with the cooperation of San Diego Gas & Electric Co. lighting engineers. The Mission Valley cloverleaf of the highway will have 40 of the lights.

The city of San Diego has plans for similar lights in other sections of the city, according to City Traffic Engineer James E. Reading. Immediate plans are for the installation of 42 lights along Pacific Highway in groups of four at seven intersections and in groups of two at seven intersections. Long-range plans will be considered for several other street lighting improvements at city council's spring budget sessions.

● WARNINGS have been issued by safety engineers over the disposal of fluorescent tubes. Since the fluorescent powder inside the tubes contains beryllium and some free mercury, the dust may be inhaled or cuts or scratches from broken tubes retain beryllium compounds. Likewise the mercury vapor may be inhaled. Thus, in disposing of tubes, it is advised that they be put into weighted burlap bags and immersed in water where they can be broken with a length of pipe under water. The wet bag, unopened, should then be removed and dumped. Cuts from the coated glass should be seen by a physician at once, as the powder may delay healing and cause excessive growth of scar.

● SACRAMENTO MUNICIPAL UTILITY District has purchased the building now occupied by the Northern Motor Co. at 2101 K St., it was announced by J. E. McCaffrey, general manager and chief engineer of the district. It is expected that the district will move into the new building late this year. Quarters now occupied at 1325 K St., and 4th and J Sts., will be vacated at that time.

● HAWAIIAN ELECTRIC Ltd. has announced the opening of its new home service department on the second floor of the main office building on King and Richards St.

"Give us the tools . . ."

Now is the time to *FIGHT SOCIALISM* in Washington

Do we want to follow Britain down the economic skids?

We Americans face that question today. For we are being advised by Administration economists in Washington to take the course which destroyed Britain industrially. It is the temporarily easy course of cutting down expenditures for tools in order to have more things to consume right away.

The President's Council of Economic Advisers tells us we are spending too large a part of our national income on new tools and equipment. A larger share, they say, should go for goods and services used directly by consumers.

Before we take that advice, let us look at Britain. When the British once allowed their industrial plants and equipment to run down – they started down a dreary road to industrial stagnation and decay.

British industry once ruled the world. Low production costs enabled it to undersell all competitors. Efficiency gave British workers the highest living standards anywhere.

Now all that Britain has between it and economic disaster is pluck and American aid through the Marshall Plan.

The British people are living poorly – still on rations and in austerity. With practically everyone working, and working longer hours than we do in the United States, they cannot produce enough to pay for the raw materials and food they must import.

How did Britain get in this fix?

The story is complicated. British sacrifices in two wars play a tragic part in it. But another fact also stands out:

Britain began to go downhill even before World War I – when British industries allowed their plants and equipment to grow obsolete.

Once that process started, it grew steadily worse. By 1929 the share of Britain's national income being plowed back into capital investment had shrunk to less than two-thirds of what it had been twenty years earlier. We were putting twice as big a share of our national income into capital goods at this same time.

Skimping on capital equipment – on new plants and new tools – put the skids under industrial Britain.

World War II only speeded up a process already well under way.

continued on next page

British industry today shows the results of its failure to keep up to date. Here are three examples found by Dr. Laci Rostas, Britain's leading authority on measuring workers' productivity:

An American produces *four* times as much pig iron as his British counterpart.

He produces *more than four times* as many tires.

In all industry, on the average, an American produces almost three times as much.

The real reason is the American's better tools. The British are struggling with equipment that is, on the average, forty years old.

Britain once had a big head start in industrial equipment. But she let it slip away. And as it went, Britain's industrial and political leadership slipped with it.

How could British leaders have slept while all this happened?

This, too, is a complicated story. But parts of it stand out clearly:

1. *British business men put in more time perfecting cartels to avoid competition than they did in improving their plants and equipment to meet it.*

2. *British labor leaders concentrated on sharing the work and sharing the wealth—rather than doing the job necessary to have enough wealth to make the sharing worthwhile.*

3. *British governments taxed away the means to buy new equipment. By steadily increasing personal taxes, they undercut the* ability *of individuals to invest in new equipment. Finally, they took away the* incentive *to get new equipment by progressively taxing away any returns on it.*

4. *Farseeing socialists smiled all the while, knowing that as private industry more and more lacked the tools to do a progressive job, they would have their chance to run the country.*

Now, with Britain's fate in their hands, the socialists are trying desperately to stem the nation's economic decline by rebuilding its industrial plants and equipment.

They are making a little headway, but not enough. There are several reasons. One is that Britain must export most of the new equipment she can make. *Another major reason—increasingly important for her future—is that money needed to renovate Britain's run-down industry is taxed away to support welfare programs.* The (London) *Economist* grimly puts it this way:

"The importance of the function of saving has only been discovered now that the means of saving have largely been destroyed."

Our own Federal and State governments, too, have dangerously whittled away incentives. They have more than tripled tax rates on personal and corporation incomes in the last twenty years. Now, the President proposes to do more whittling.

If the United States is not to go Britain's way, we must preserve our incentives to save and to invest in industry.

If the United States is to progress, we must continue to build up our industries.

The President's Economic Advisers say we can slow down. But the McGraw-Hill survey of "Business' Needs for New Plants and Equipment," reported in the previous editorial in this series, produced facts to the contrary. It showed that industry *now* plans—*if it can get the money*—to spend $55 billion in the next five years for new plants and new tools. Moreover, it showed *industry's needs* for new facilities are large.

By cutting down the incentives to save, by giving soothing advice that we do not need to save so much, Washington is pushing us toward Britain's way—the route via industrial stagnation to socialization.

Before we skid too far, we should pull up short and ask ourselves: Do we want to go Britain's socialistic way?

There still is time to say, "No."

A complete report on our national survey, "Business' Needs for New Plants and Equipment," may be obtained by writing McGraw-Hill Publishing Co., 330 West 42nd St., New York 18, N. Y. This is the fifth editorial of a special series on industry's needs for new plants and equipment.

James H. McGraw, Jr.

President, McGraw-Hill Publishing Company, Inc.

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Ground was broken last month for construction of this new Public Service Co. of New Mexico plant at Santa Fe. The building will conform to Santa Fe's unique style of architecture and will occupy 6,300 sq. ft. of floor space on the ground floor. When completed the plant will cost approximately $1,000,000. A 6,000-kw. steam turbine generator is now being built for the installation

Seattle Contractors Fined in Court Case

Seattle Electrical Contractors Assn., its manager and members were fined a total of $21,500 in federal court at Seattle, Wash., after they had entered pleas of 'nolo contendere" to charges of violating the Sherman antitrust act.

"We question whether the charges made could be substantiated but such a trial would be necessarily long and expensive," counsel for the defendants said after changing the pleas from innocent.

The defendants were charged with maintaining a bid depository, refusing to supply labor to install electrical equipment unless the equipment was purchased from them and employing a fixed, uniform and non-competitive method for calculating prices in the sale and installation of electrical equipment in the Seattle area.

District Announces Rate Reductions

The Sacramento (Calif.) Municipal Utility District has announced rate reductions for the system's 72,800 customers beginning June 30. The new rates are estimated to be about 8% lower for residential service and 4% for commercial service and will lower gross income for the utility by about $327,000. The district took over the system Jan. 1, 1947, from the Pacific Gas & Electric Co. and has since expanded the operation by about 25%. The SMUD now purchases all its power from PG and E at a rate estimated to average 5.8 mills per kwh., said to be the lowest in the nation.

● WATER HEATING boilers, tank heaters and storage tanks, as well as automatic electric and gas water heaters, must now be of a design approved by the Boiler Inspection Department of the British Columbia government. New legislation was recently enacted in British Columbia setting standards for water heating equipment to be installed in rooming houses, apartment houses and industrial plants which come within the scope of the Workmen's Compensation Board Act in British Columbia.

● THE EUGENE (Ore.) Water & Electric Board has invited bids on construction of the second unit of the Walterville hydroelectric station, a step in the city's $7 million project designed to increase the output of the municipal power unit. The invitation covers construction of the forebay and headworks of the development. Bids will be received until April 21.

● THE CALIFORNIA PUBLIC UTILITIES Commission has completed a map of electric generating stations, transmission lines and interconnecting systems in California as of August 1, 1948. Printed in 12 colors; available from the commission for $1.54 a copy.

● HAWAIIAN ELECTRIC Co. has expanded its system by purchasing a system serving some 800 users that was owned and operated by the Ewa Plantation Co. Hawaiian Electric, which serves most of the island of Oahu, takes over the whole system from the sugar company at an undisclosed price and will continue to serve its plantation villages.

Report Made on Alaska Potential

Alaska River control systems could produce 50 billion kwh. of electrical energy annually, Joseph M. Morgan, chief of the Alaska investigations of the Bureau of Reclamation, said recently at Juneau, Alaska, after completing a reconnaisance report on potential development of water resources in the territory for power production and other uses.

"More power can be put into Juneau, Fairbanks and Anchorage than is now available in any city in the world, regardless of its size," he said.

Potential annual power production in kwh. for various Alaska regions follows: southwest, 12,270,000,000; south central, 18,440,000,000; Yukon-Kuskokwim, 14,740,000,000; Seward Peninsula, 200,000,000.

Bonneville Awards Construction Contracts

The Bonneville Power Administration has awarded the following contracts: construction of the Index-Snohomish section of the Foster Creek-Snohomish 230-kv. transmission line, Smith Bros., Vancouver, Wash., $598,619; 230-kv. single-circuit steel towers for the Olympia-Covington line, Isaacson Iron Works, Seattle, $525,683; construction of the Scenic-Index section of the Foster Creek - Snohomish 230 - kv. transmission line, Parker Schram Co., Portland, $728,697.

● MOLONEY ELECTRIC Co., St. Louis, Mo., has been awarded a contract by the U. S. Bureau of Reclamation for six 60,000 - kva., 13.8/230 - kv. transformers for the Hungry Horse project on the Columbia River near Kalispell, Mont. Dam and power plant are scheduled for 1953. Power will be fed into the Bonneville Power Administration system over 230-kv. transmission lines.

● FIRST TELEVISION station for San Diego, Calif., is expected to be in operation by May 15. Jack Gross, manager KFMB, ABC network, has been assured by General Electric that it will ship the transmitter around March 15, while Austin Co. has agreed to build the TV station in 30 days. Robert Lee, chief engineer for the radio station, will direct the installation.

● MAJOR ALUMINUM PRODUCTS, Vancouver, B. C., has been awarded contract by the Vancouver city council for the supply of 500 aluminum ornamental light standards at a cost of $90 each.

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A. The Positive Initial Grip

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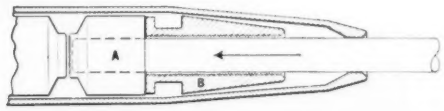

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3. NATIONAL ELECTRICAL CODE HANDBOOK

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4. THE LINEMAN'S HANDBOOK

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Here are principles, data, methods, and cautions on all aspects of the linemen's work. Everything is covered from elements of electricity to maintenance of lines, and first aid work. Familiarizes you with every component of transmission lines—electrical fundamentals and electric circuits, the electric system from generation to distribution, design of transmission lines, etc.

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NEWS ABOUT PEOPLE

● APPOINTMENT of R. E. FIFE and WAYNE N. JOHNSON as vice-presidents of Southern California Edison Co. was announced by Harry J. Bauer, chairman of the board, and W. C. Mullendore, president. At the same time announcement was made of election of JAMES E. SHELTON, president of the Security First National Bank of Los Angeles, as a director replacing FRED B. LEWIS, former vice-president and general manager of Edison and director since 1945. Fife joined the company in 1919, working first in the accounting department and later was made executive assistant. In 1945 he was elected comptroller. Johnson joined the Edison Co. in 1937 as manager of the Vernon district. Four years later he was appointed superintendent of distribution and later became assistant manager of operation. He was made manager of the frequency change project in 1945.

● BETH MCCRONE has become lighting consultant for California Electric Supply Co., San Francisco, with particular interest in residential lighting. Miss McCrone recently returned to San Francisco after a year with General Electric Lamp Department at Nela Park, Cleveland. Prior to that she was residential lighting specialist for Pacific Gas and Electric Co. During the war she was illuminating engineer for Western Pipe & Steel Co. shipyard. A graduate of Stanford in illuminating engineering and architecture, her work will be with architects and builders to plan lighting for homes and buildings.

● O. G. "Andy" ANDERSON, who aided in the development of special hot-line tools for the Los Angeles Water & Power Department's Boulder Dam-Los Angeles line, has been appointed division sales manager of the Missouri Valley division for the A. B. Chance Co.

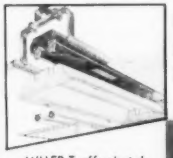
● MERRILL J. SAHLI has been appointed acting superintendent of the sheet mill of the Torrance Plant of Columbia Steel Co., according to O. A. Kresse, general superintendent.

● MORLEY COLLINS of the information branch of the British Columbia Electric Co. at Vancouver, has been transferred to Victoria. At the same time the company announced that

Fife Johnson

EDWARD F. FOX, who has acted as information official for the company in Victoria since 1945, has been transferred to Vancouver, where he will work with W. C. Mainwaring, vice-president of the company.

● LLOYD HENLEY of Fresno, Calif., has retired as commercial manager of the San Joaquin Power Division of Pacific Gas and Electric Co. He had been with the company for 28 years.



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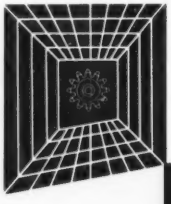

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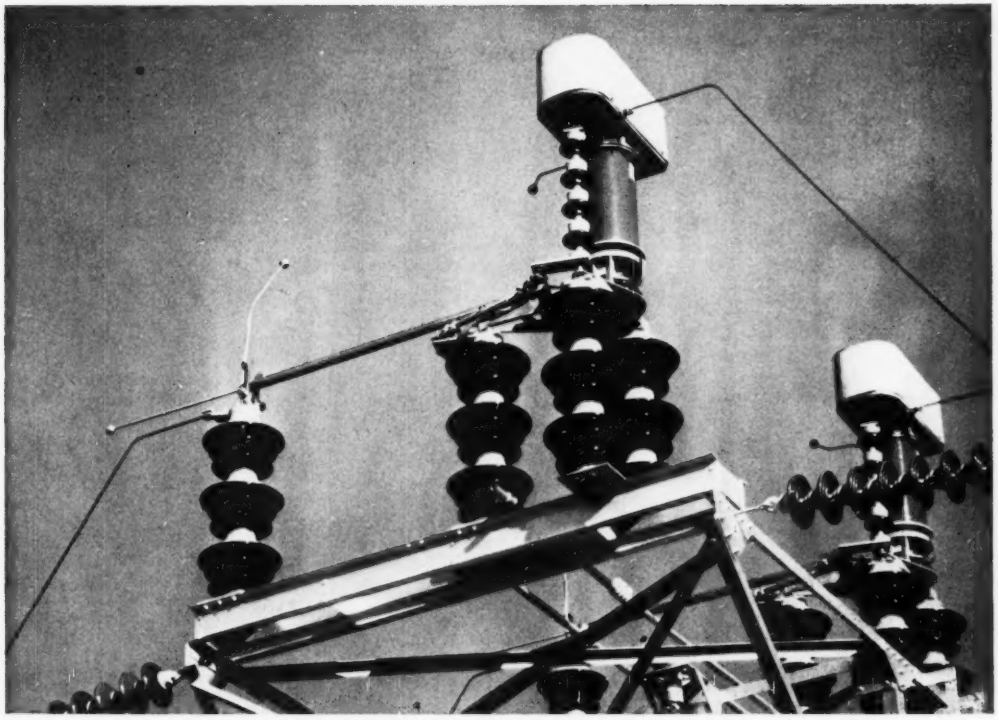
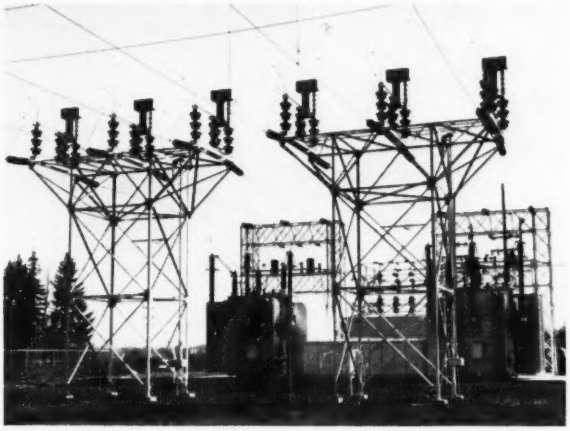


NEW *High Voltage Interrupter Switches*



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● SOUTHERN CALIFORNIA EDISON CO. has announced the following changes in district superintendents: J. S. MAYALL, district superintendent at Redondo Beach, has moved to the general office as chief right of way engineer. L. M. JUDY fills the vacancy at Redondo. O. E. WHITE has been moved from Ventura to Huntington Beach as district superintendent. F. S. TAGGART has become superintendent at Ventura, and GLEN TAYLOR has left Redlands to fill the post at Inglewood.

● RODNEY M. POLLARD is the new appliance sales representative for General Electric Co. in the Seattle office of the company's Pacific district, according to B. M. Tassie, district manager of appliance sales. Pollard was formerly with General Electric Credit Corp. in San Francisco.

● R. A. POTTER has recently been assigned to Westinghouse Electric Corp. Salt Lake City office as street lighting and industrial power specialist. Potter arose from journeyman electrician for a contractor, was lighting specialist for Boston Edison Co. and later joined Westinghouse.

● W. J. VARLEY, manager, San Francisco Electrical Contractors Assn., and for some years a San Francisco representative on the Golden Gate Bridge district board of directors, has been named president of that board.

● A. V. K. BABCOCK has been promoted to the newly created position of director of budget control in the executive department of Central Arizona Light & Power Co., according to Henry Sargent, president.

● H. L. WHEELER, formerly manager of the right of way and land department of Southern California Edison Co., was recently made executive assistant of the company.

● C. H. BARTLETT, formerly in the Westinghouse transformer sales department at its Emeryville plant, has been made manager of power transformer sales of the Westinghouse Transformer Division, Sharon, Pa.

● G. L. MACLANE Jr., formerly with Central Arizona Light & Power Co., has been made assistant manager of the engineering laboratories and standards department of Westinghouse Electric Corp.

● GEORGE M. GADSBY, president and general manager of Utah Power & Light Co., has been appointed chairman of the newly created committee on timber, soil and water conservation of the National Association of Manufacturers.

Bateman

● IVAN L. BATEMAN has taken on duties as electrical engineer in charge of the power operation and maintenance division of the Los Angeles Department of Water & Power. He replaces H. L. CALDWELL, who has retired. Bateman joined the department in 1926 as a power house and station operator. Since 1946 he has served as assistant division head.

● J. E. E. ROYER, vice-president and general manager of Washington Water Power Co., has announced the following assignments within the company: C. REA MOORE, manager of the rate and economic research department, is now engaged in special assignment work for the executive department. A. H. WEGNER has taken on Moore's former duties. AL GRUBER, former industrial sales engineer, is now industrial sales department manager. R. B. MCELROY has been named acting sales manager of the company.

● W. J. DELEHANTY, formerly sales manager of the Oakland works of the apparatus department of General Electric Co., has been made sales manager of the Oakland section of the wire and cable division of G-E, with headquarters at Oakland.

● ALEX KUEHLTHAU has taken over the position of executive manager of the Seattle operations of Northwest Appliance Distributors Inc. For the past several years he has served as Pacific Coast manager of Electromaster Inc.

● On Feb. 15 L. C. JOHNSON became assistant district credit manager of Graybar, San Francisco. At the same time Burton R. Cole was named manager of its Fresno, Calif., office.

● ELLERY R. FOSDICK, assistant director of power utilization for the Bureau of Reclamation for the past five years, has resigned to join the consulting engineering firm of H. Zinder in Washington, D. C. During his service with the Reclamation Bureau, he was especially active in that agency's planning of power facilities for the Missouri and Columbia River basins. A graduate of Washington State College, he received electrical engineering degrees from that institution in 1924 and 1931. During the same period, he was employed by the Washington Water Power Co. He then opened his own consulting office in Spokane. In 1933 he became an engineer for the Washington Department of Public Service, where he remained until 1938, when he joined the staff of the Federal Power Commission. He was chief of electric rate investigations for FPC when he resigned to go with the Bureau of Reclamation in February 1945.

● HENRY H. FAULKNER, formerly sales promotion manager for Westinghouse Electric Supply Co., Salt Lake City, has been named farm sales supervisor for the southern California district of the company. Although district headquarters are maintained in Los Angeles, Falkner will make his own headquarters in Salt Lake City. He was at one time associated with the Utah Power & Light Co.

● S. B. WILLIAMS, former editor of *Electrical World*, and a past president of the Illuminating Engineering Society, is now manager of public relations of Sylvania Electric Products Inc. He has been with Sylvania since 1947 as manager of customer relations for the lighting division.

● PAUL ROEGNER has been appointed a business representative of Local 77, IBEW, with headquarters at 317 Wall St., Seattle. Roegner, a charter member of Radio Engineers, Local 77, replaces W. A. SMITH, who has been transferred to the International office of the IBEW in San Francisco.

● A. L. HAWLEY, formerly assistant works manager of the Plomb Tool Co., has taken over duties as works manager of the main factory in Los Angeles, it was announced by C. W. Coslow, vice-president in charge of manufacturing.

● FRANCIS X. BLACKWELL has been made vice-president and sales manager of the Kay Wholesale Electric Co., Los Angeles. He was formerly a salesman for the Hollywood Wholesale Electric Co.

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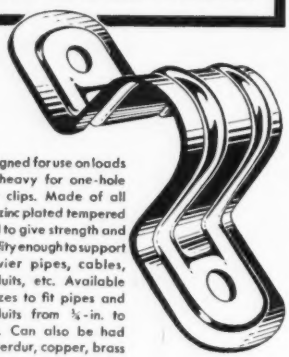

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● JACK CLAY, former Utah Power & Light Co. official, and C. H. RHUDY, superintendent of transportation for California Electric Power Co., have been appointed as members of a 12-man mission for the U.S. government. Their job will be to assist in the rehabilitation of the Korean electric power generation and distribution system.

● T. C. GILLILAND, formerly sales representative for the electronics department of General Electric Co., has been appointed district representative of the receiver division, electronics department of the company. His territory will include northern California and Hawaii, and he will maintain headquarters in San Francisco.

● PAUL C. VAN CLEAVE has been named district manager of the Los Angeles warehouse of United States Steel Supply Co., a subsidiary of United States Steel, and FRANK B. STEWART has been appointed district manager of the San Francisco warehouse of the company.

● JOHN F. MCDANIEL, former Pacific Northwest district manager of Hotpoint, and now manager of the refrigerator department of the company, has been elected chairman of the household refrigeration section of the National Electrical Manufacturers' Assn.

● R. J. FRANZEN, formerly with the Seattle branch of Graybar Electric Co., has been made manager of the Tacoma branch of the company. W. R. WINDFIELD has been advanced to district operating manager of the Seattle branch of Graybar.

● CLIFFORD W. LORD has been elected vice-president in charge of all Pacific Coast warehouses of United States Steel Supply Co., including two newly added facilities at Portland and Seattle.

● L. W. PATMORE, legal member of the Public Utilities Commission in British Columbia for the past ten years, has resigned. A successor has not been appointed.

● ALBERT T. BERGERON, former district sales manager operating out of San Francisco, for the Miller Co., Meriden, Conn., has been elected a vice-president of the company.

● CHARLES MONSON, formerly assistant to the vice-president of Puget Sound Power & Light Co., has been appointed assistant superintendent, reporting to Charles Terrell, vice-president in charge of operations.

● JOHN D. ENEFER, former assistant manager, frequency change department, Southern California Edison Co., has left the company to become vice-president and general manager of a newly formed company named the International Electric Co., with offices at 2003 S. Olive St., Los Angeles. Enefer had been with the Edison Co. for 31 years.

● GEORGE W. BLOOMFIELD, general office manager of the Los Angeles branch of George E. Wilkins Inc., appliance distributor, has been appointed division manager of the Salt Lake area for the firm. He will direct sales for the firm in Utah, Idaho and eastern Nevada.

● R. C. EHRMAN has been named industrial relations and quality control supervisor of the Oakland Lamp Works of General Electric Co. He has been with the company since 1937, serving most recently as supervisor of personnel and labor relations at the Oakland Works.

● NEW DISTRICT sales managers appointed by the electrical wire and cable department of United States Rubber Co. to supervise sales of electrical wire and cable on the West Coast are A. B. Gangwer, Denver, and I. M. Guibara for Los Angeles, San Francisco, Portland, Seattle and Salt Lake City.

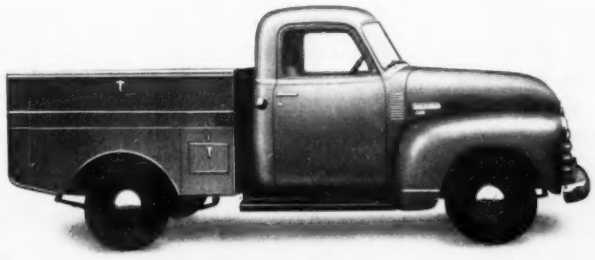
● JAMES LIGHTBODY has retired as manager of the publicity department of British Columbia Electric Railway Co. at Vancouver. Joining the company several years ago, he organized the publicity and advertising department of B. C. Electric Co.

● M. M. KOCH, vice-president and general superintendent in charge of electric operations of the Public Service Co. of Colorado, was chosen to be the new director, replacing the late William C. Sterne.

● BRUCE HOWARD has been appointed sales manager of Associated Distributors, Vancouver, B. C. He was formerly with the J. W. Kelly Piano Co. in Vancouver.

● PAUL PALMER, formerly with the Los Angeles office of Electrical Specialty Co., has been appointed manager of the firm's Portland branch. He replaces Howard Perkins.

● E. W. PHILLEO of the General Electric X-ray Corp. has been made manager of the Pacific region. His headquarters will remain in San Francisco.



UTILITY SERVICE TRUCK BODY —MODEL 60KD

Designed for carrying tools and materials to and from the job. Shipped to customer partially knocked-down at a low cost.

Model 60KD all steel service body, 75" long with generous side compartment space. Electric welded. Engineered for customer satisfaction. Designed for installation on a late model ½ ton chassis. *Lower shipping costs* to you, due to small compact package. *Low priced* to you, because Model 60KD is jigged-constructed and produced in volume quantities. *Easy to assemble*, requiring a minimum of time. Simple, easy to follow assembly drawing furnished. Optional equipment available; 3 types overhead ladder racks, material trays, extension ladders.

WRITE FOR BULLETIN "E"

ARTISAN PRODUCTS, INC.

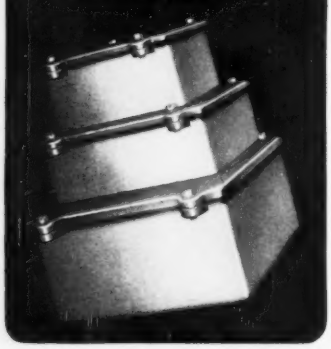
3490 West 140th Street Cleveland 11, Ohio

Junction

PYLETS

Thick Wall

Weatherproof



These heavy-duty Junction Pylets are built to withstand severe service conditions, and are furnished complete with overlapping gasketed covers held in place with slotted hexagon head cap screws. These boxes are available in a full range of sizes up to 26 x 18 x 8 inches, and can be furnished drilled or tapped for conduit as specified.

Junction Pylets also available—Flush Type with cover screws inside; Hinged cover type; and Threaded cover type.

Refer to your Pylet Catalog for complete listing.

SINCE 1897

THE PYLE-NATIONAL COMPANY

1364 N. Kostner Ave., Chicago 51, Ill.

Pacific Coast Sales Office
25 Beale Street, San Francisco 6, Calif.

● EFFECTIVE March 7, R. J. Franzen assumed duties as manager of the Tacoma branch of Graybar Electric Co. Inc. He joined Graybar in 1935 as warehouseman in the Spokane branch, and later became stock maintenance clerk and operating clerk. In 1940 he was appointed assistant to the lines manager at Seattle. Prior to his work with Graybar, Franzen was employed by the Washington Water Power Co. in Spokane.

● WILLIAM DE WAARD, superintendent of stores, and SYD ROBINSON, purchasing agent, of San Diego Gas & Electric Co., were severely injured in an automobile accident while on their way to attend the funeral of Fred Henry, purchasing agent of Southern California Edison Co., in March. Both are confined to the Oceanside, Calif., hospital until they can be moved back to San Diego.

● LOREN W. EAST, Los Angeles consulting engineer, has been named public utility engineer for Oakland. He served with the California Public Utilities Commission from 1930 to 1943, when he resigned to enter private practice. In his work with Oakland he will represent the city in rate increase applications of the Pacific Gas and Electric Co. and other utilities before the state PUC.

● ROY H. LUND, former safety and training supervisor for the British Columbia Electric Co., Victoria, has assumed duties as personnel supervisor for the company. He succeeds JOHN M. ROCKINGHAM, who has been promoted to a position with the company's transportation division in Vancouver, B. C.

● ARTHUR J. REYNOLDS has been appointed sales promotion manager of Westinghouse Electric Supply Corp., Salt Lake City, succeeding HENRY H. FOLKNER, who has been named a district manager for the firm. Reynolds was a former manager of the Intermountain Electrical Assn.

● A. C. BLACKMAN, chief of the division of industrial safety, Department of Industrial Relations of the State of California, has become a member of the Casualty Council of Underwriters' Laboratories Inc., and also an associate member of the corporation.

● T. I. MOSELEY, president of Dalmo Victor Co., San Carlos, Calif., has announced that the company has retained C. J. Burnside, radio engineer and executive, as a general industrial consultant.

● ROBERT C. MCFADDEN, an assistant vice-president of Southern California Edison Co., has been elected a vice-president of the company. He succeeds R. R. Walbridge, who was killed in an automobile accident last February.

● SIDNEY B. KNOPH, head of the power accounts bureau of Pacific Gas and Electric Co., retired Jan. 1. He joined the San Francisco Gas and Electric Co., a predecessor of PG and E, in 1910.

● GEORGE R. COFFIN has been appointed assistant district manager of United States Steel Supply Co.'s warehouse in Portland. EDWARD C. LA BART will serve in a similar capacity in the firm's Seattle warehouse.

● JOHN REINE has been appointed manager of the Portland branch of Graybar Electric Co. He was formerly manager of the Tacoma branch of the company.

● K. WARREN SNIDER, district representative of Motorola Inc., has been elected vice-president of the Los Angeles Junior Chamber of Commerce.

● R. E. BROWN, formerly factory representative for Westinghouse, San Francisco, has joined the Frigidaire organization in Oakland, as division manager.

Deaths

● LUKE R. STOREY, who rose from lineman to become vice-president and general manager of Home Gas & Electric Co., Greeley, Colo., died suddenly of heart attack March 3. He was a past president of Rocky Mountain Electrical League, and was one of the founders of Rangely Power & Light Co. Most notable was his regaining local ownership of the Home Gas & Electric in 1944 after a long period during which it was owned by Western Light & Telephone Co. of Kansas City. Born on a farm in Kansas in 1888, he started as apprentice electrician for duPont Powder Co. Early in life he went to Colorado and worked on transmission lines over the Rockies. He worked for Mountain States Telephone Co., Colorado Midland and Denver & Rio Grande Railways. In 1913 he started troubleshooting for Home Gas & Electric, was made superintendent in 1917, did much to develop rural electrification and pump irrigation in the area.

● ARTHUR T. LAWSON, 46, San Joaquin Valley division manager of the Southern California Edison Co., died Feb. 28 at Visalia, Calif.

It's your SCRAP for more Steel!

CASE STUDY NO. 1:

88 Carloads

Here's a photographic equipment manufacturer with a systematic metal-salvage program. No more scrap, they said. Yet, after more careful study, they found 88 carloads of heavy iron and steel scrap in a 30-day period!

CASE STUDY NO. 2:

Metalworking Plant Surprised!

This big fabricator reported all scrap being turned in. When told needed scrap includes old equipment, not just "production" scrap, they uncovered extra tons of iron and steel.

CASE STUDY NO. 3:

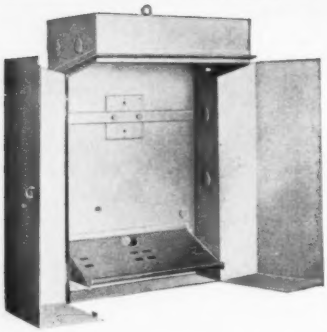
Paper Converter Delivers!

This plant replaced 3000 obsolete machines with new ones. Held old ones for occasional spare parts. Changed mind, scrapped 2800, reduced inventory, got high price for scrap.

You, too, may have heavy iron and steel scrap you don't know about. It's the *heavy* scrap that makes the best steel and by processing faster, increases steel output. Appoint one top official of your company to find it. Today, it's dead inventory. Tomorrow, it can be money in the bank. But better than that, it can help to build the one million tons of reserve scrap that we need to increase production for domestic use and for security purposes. Remember—scrap reserves are low, the price of steel scrap is high. Help America and yourself by putting your scrap back to work.

ELECTRICAL WEST

KEES TRANSFORMER HOUSING



For 4 Transformers 2 CURRENT ...2 POTENTIAL

No. 3624-14

- Accommodates high insulation types of G-E and Westinghouse transformers, ratio 20 to 1, 2300-volt primary.
- Mounting-bar which supports the two current transformers may be attached vertically or horizontally.
- 16-Gauge galvanized sheet steel, welded construction throughout. Baked-on aluminum enamel finish. Doors hinged, both sides, with hold-backs and latch.
- The two potential transformers rest on shelf which slopes to front of housing — gives added clearance, makes installing and replacing easier.
- Knockouts for insulator bushings are spaced to coordinate with current transformers mounted either in vertical or horizontal position.

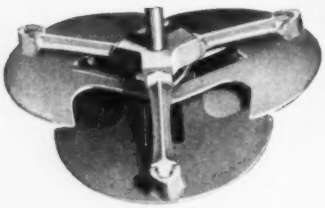
Manufacturers of Meter Boxes, Pull Fuse Switches, Meter Test Blocks, Portable Handi-Lites.

Write Dept. EW-1 for Free Catalog

KEES

F. D. KEES MFG. CO. BEATRICE NEBRASKA

EXTRA Holding Power
QUICKLY Installed
TOUGH For long life



EVERSTICK ANCHORS

For new construction and maintenance — Everstick Anchors speed up work and provide dependable anchorage on all types of jobs. Made of resiliant, rust resistant malleable iron. The toughest anchors made. Write for bulletin.

EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

ALL the strength and durability inherent in steel are combined---with definite economies---in *Crapo* Galvanized Steel Strand. Heavy, ductile, tightly-bonded zinc coatings, applied by the famous *Crapo* Galvanizing Process, provide lasting protection against corrosion.

Ask the distributor of *Crapo* Galvanized Products near you or write direct for further information!

INDIANA STEEL & WIRE CO.
MUNCIE, INDIANA

NOTES ON THE TRADE

Service Shop Enlarged At Seattle

A new and expanded apparatus service shop, replacing one established in 1923, has been opened in Seattle by General Electric's apparatus department. It is one of the most modern of the company's 29 service shops, according to J. R. Murphy, apparatus department manager for the Northwestern district.

Harry W. Siebert, for many years superintendent of the old Seattle service shop, will continue in this capacity, with C. E. Simonds as assistant superintendent.

Located on a two-acre tract with a railroad siding and ready accessibility to main truck routes, the new shop has facilities for repair of motors, controls, turbines, and transformers, as well as marine, transportation, and other electrical equipment. The shop includes three main sections: a heavy equipment repair and reconditioning section, an aircraft equipment section, and a manufacturing section in which all types of standard and special industrial control and switchgear are produced. In addition, it has facilities for manufacturing coils, rebabbitting bearing linings, building up shafts, dynamic balancing and testing.

● RUDOLPH BEARD recently joined Scott-Buttner Electric Co. of Oakland and is general manager for Ed Buttner. Beard for many years had been with General Electric Co., in its industrial division, San Francisco. Scott-Buttner Co. also recently moved to much larger quarters in a new building of its own at 896 2nd St., Oakland, and is in electrical construction and motor business only, having sold its appliance business at 103 Grand Ave., Oakland, to Gray Minor, Piedmont dealer.

● FASCO INDUSTRIES, INC. is the new name for F. A. Smith Mfg. Co., manufacturer of fans, motors, ventilators and automotive electrical equipment. H. P. Toppin, president, announced that the name change does not affect the corporate structure, officers, directors or policies of the firm.

● MARCUS TRANSFORMER CO, INC., Hillside, N. J., has appointed the E. B. Cook Co., 1063 Howard St., San Francisco, as its territorial representative for northern California.

New Appliance Branch At Vernon

Westinghouse Electric Supply Co. on March 11 opened its new Vernon, Calif., branch at 4601 S. Boyle Ave. L. C. Berger, southern California district manager, and M. B. Sauer, Vernon branch manager, were hosts at open house. Company executives attending included D. M. Salsbury, president, and J. T. Urban, general appliance manager, of the Supply company, who came from New York; I. F. Brownson, manager, major appliance divisions, Mansfield, Ohio, and J. J. Moffatt, Pacific Coast District manager, appliance division, Westinghouse Electric Corp.

The new quarters comprise an area of 65,200 sq. ft. in which are located the electrical appliance, radio and television offices, complete sales, service and warehouse facilities, large display rooms and an auditorium with full stage equipment.

Headquartered at the new branch will be W. W. Bell, appliance sales manager; R. J. Wells, stores manager; B. A. Olson, sales promotion manager; James B. Heazlett, credit manager; Don Johnson, radio and television service manager; Elbert Kramer, district appliance sales promotion manager, and J. H. McCarty, district service manager.

The apparatus and supply divisions, with the specialties and traffic appliance department, will continue at the company's 905 E. Second St. address.

● California Electric Supply Co., San Francisco, has set up a television service shop at 12th and Folsom Sts. Larry Courtney and Richard West have been added to the firm's staff and will work under Lee Bird, television service manager. Robert Chambers, formerly in the company's radio and appliance service department, has been transferred to the television installation department.

● Sues, Young & Brown Inc., wholesale distributors, have withdrawn from the northern California area, and discontinued their offices at the Western Merchandise Mart, San Francisco. The Coolerator line, formerly handled by Sues, Young & Brown in northern California, has been taken over by Pioneer Appliance Co., San Francisco. Sues, Young & Brown are expanding their southern California operation.

● Gregory Electric Co. of Chicago has organized a Western plant at 2650 E. Washington, Los Angeles, to produce transformers. The site was formerly occupied by the Western Electrochemical plant.

TERRITORIES AVAILABLE to...

progressive, reliable DISTRIBUTORS AGENTS & DEALERS!

the New Improved...

"POLAR BREEZ" AIR COOLER

If you handled the nationally accepted and profitable Hall line before the war, you'll be glad to know these top quality evaporative cooling units are again available with many improvements. "POLAR BREEZ" is sold in complete "packaged units" in various sizes for all types and sizes of business buildings and stores.

Air is purified by a chemical process removing bacteria and algae. Range—2000-25,000 C.F.M. . . . Glass Fibre Cooling Pads . . . Self cleaning—no servicing or replacement . . . Weather Proof Metal Housing . . . Multi-Blade Pressure Type Blower . . . Directional Flow Grille . . . Roto-Atomizer . . . Doubles cooling and washing action!

"Backed by over 25 years in the Industry." Formerly manufactured and distributed by the Hall Mfg. Co., Cedar Rapids, Iowa.

INVESTIGATE NOW! Write, wire, or phone for details—Morton Grove 4594.

AIR COOLING ENGINEERING CO.
Dept. W Morton Grove, Ill.

MOTORS, GENERATORS, TRANSFORMERS
1 — 1500 H.P.
Bought and Sold New and Rebuilt
ELECTRIC EQUIPMENT CO.
ROCHESTER 1, N. Y.

U. S. Pat. 2,181,076
MULTIFLEX BRUSHES
GIVE YOUR MOTORS & GENERATORS
• IMPROVED COMMUTATION
• MORE UNIFORM WEAR
• LOWER OPERATING COSTS
HELWIG CO., Carbon Products
See Telephone Book for nearest office.

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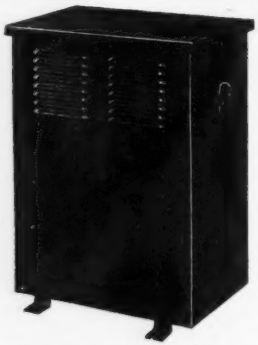
DIRECTORY OF MANUFACTURERS
WHERE-TO-BUY in the WEST
DIRECTORY OF APPLIANCE SERVICE and REPAIR PARTS
DIRECTORY OF WESTERN REPRESENTATIVES
Keep these Directories for reference throughout the year.
ELECTRICAL WEST
68 Post St., San Francisco 4, Calif.

FLEXO MANHOLE SHEAVE
SELF LOCKING—no blocking or bracing. Securely held by rope tension.
STURDY CAST ALUMINUM FRAME
TWO CAST-IRON PULLEYS
Write for descriptive folder.
WEIGHT 96 lbs.
FLEXO MACHINES CO.
456 N. Aberdeen St., Chicago 22, Ill.

ECONOMICAL

Jeffries Transformers



Reasonable in Price
Reliable in Performance

Jeffries large transformers are priced reasonably—and you can save their first cost in a short time by minimizing current losses. When you use a Jeffries transformer, you can provide voltage change at the point desired, without prohibitive expense.

We supply all types and sizes. If not in stock, we build to order in a hurry—a week to 10 days.

Write today for catalog.

JEFFRIES TRANSFORMER COMPANY

1710 E. 57th St. Los Angeles 11, Calif.

ILSCO
Electrical Connectors

MANY TYPES AND SIZES

WRITE for 54-page illustrated catalog.

Western Representatives:

Electrical Specialty Co. Seattle—San Francisco

Strieby & Barton, Ltd. Los Angeles

ILSCO COPPER TUBE & PRODUCTS, Inc. CINCINNATI

● Andrews Electric Motor Works of Modesto has just moved into a new building at 600 11th St. Don Andrews, who took over the pioneer business from his father, Frank Andrews, now operates the enlarged plant. Frank Andrews has his office as consulting engineer at 1111 F St. at the east end of the property.

● Appliance Delivery & Service, located in new quarters at 811-815 Traction Ave., Los Angeles, has reorganized and announced the following new officers: R. V. Rudolph, president; F. D. Rowe, vice-president; J. Rudolph, secretary. Dean D. Woolley is no longer associated with the firm.

● Temp-O-Matic Inc., Los Angeles firm, has been organized to manufacture, distribute and install refrigeration units and freezing devices. Principals in the firm are Russell L. Hebebrand and James M. Hebebrand, both of Beverly Hills, Calif., and Dixon T. Bell of Los Angeles.

● Charles Robbins, sales manager of Emerson Radio & Phonograph Corp., made a recent field trip to the West Coast to discuss sales and promotional plans for the 1949 Emerson radio and television line with Emerson distributors in Spokane, Seattle and Portland.

● Clarence R. Hunt announces that he has retired from the business of factory representative of electrical equipment in San Francisco. The business will be carried on by H. S. Jones, who has been associated with Hunt for a number of years.

● McCormack & Co., San Francisco, has taken on the distribution of Admiral products for northern California and western Nevada. At the same time D. F. McCormack announced the appointment of A. J. Lindholm as general sales manager, who will be in charge of a field staff of 16 salesmen.

● Stubbs Electric Co., Portland, has been named dealer for Allis-Chalmers motors, controls, Texrope drive equipment, centrifugal pumps and circuit breakers in the state of Oregon and several counties in the state of Washington.

● Line Material Co. has appointed John W. Ridenbaugh, field engineer, to serve its customers in New Mexico and several counties in west Texas. He will maintain an office at Albuquerque.

● Warren E. Marsden, 527 S. Figueroa St., Los Angeles, is the new Western sales manager of Radiant Glass Heating Corp.

● W. J. Lancaster Co., San Francisco, newly appointed distributor of Motorola products for northern California, opened its new showroom at the Western Merchandise Mart, San Francisco, late in March with display of the Motorola radio-television lines. The Bendix line, formerly handled by Lancaster, has been taken over by Paul H. Rice, Western Merchandise Mart, San Francisco.

● Kaemper-Barrett Dealers Supply Co., San Francisco, has taken over the factory branch and the sales force for the ABC line of washers and ironers, and will serve as distributors for the line in northern California and western Nevada. Art Kuhnhausen, who handled the line in the past will be manager of the appliance division.

● United Commercial Sales Co., Los Angeles, formerly headed by Ted Chamberlain, has been purchased by a small group of investors. A. H. Reinach, previously a vice-president of the company, has taken charge of the business as general manager.

● William Landsburg has been appointed sales manager for the Raycraft Co., with headquarters in Oakland and display space at the Western Merchandise Mart, San Francisco. Landsburg was formerly with National Pressure Cooker Co.

● The Firm name of Kilsby-Harmon Inc. has been changed to Perry Kilsby Inc. The company will continue to serve the industry from its Los Angeles headquarters and offices in San Francisco and Seattle.

● W. R. Hendry Co., Seattle, has been named territorial representative in the states of Washington and Oregon for the Marcus Transformer Co, Inc., Hillside, N. J.

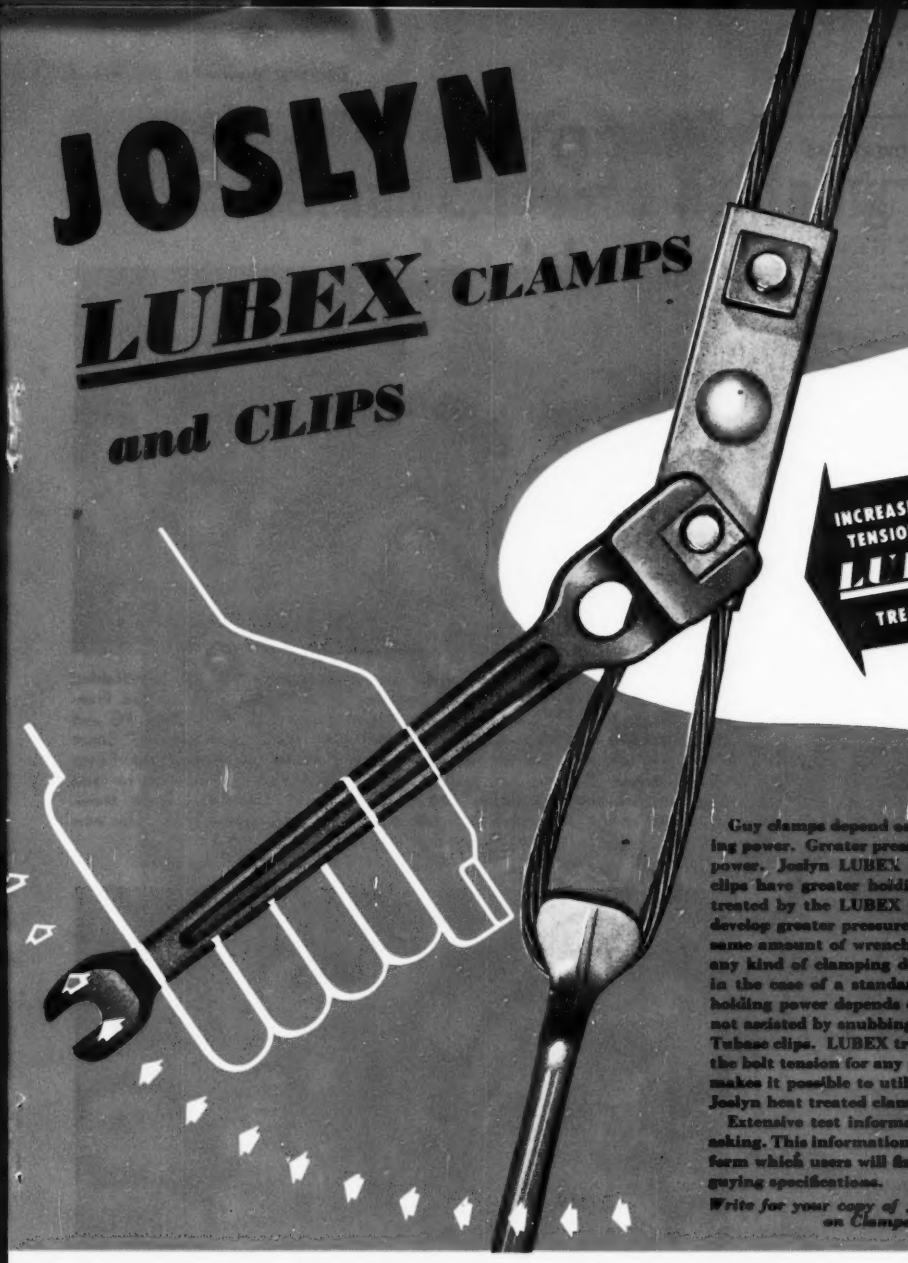
● Thomas Distributing Co., San Diego, has opened a new local branch at 1002 W. Juniper St. Branch manager is Ed Babbitt.

● W. Hart, formerly with Northern Electric Co., Vancouver, B. C., has joined J. M. Cowan & Co., manufacturers' agents in Vancouver.

● Permanente Metals Corp., Oakland, Calif., has opened its aluminum wire and cable production schedules to all users of aluminum conductor. It has announced that it will have 15,000,000 lb. of ACSR conductor ready for delivery in the fourth quarter of 1949.

JOSLYN

LUBEX CLAMPS and CLIPS



Guy clamps depend on pressure for their holding power. Greater pressure means more holding power. Joslyn LUBEX guy clamps and Tubese clips have greater holding power because being treated by the LUBEX process, it is possible to develop greater pressure on the clamp using the same amount of wrench torque. This is true for any kind of clamping device but especially true in the case of a standard guy clamp where the holding power depends on pressure alone and is not assisted by anubbing action as in the case of Tubese clips. LUBEX treatment develops double the bolt tension for any given wrench torque and makes it possible to utilise the great strength of Joslyn heat treated clamp bolts.

Extensive test information is available for the asking. This information is made up in a different form which users will find useful in determining guying specifications.

Write for your copy of Joslyn Test Information on Clamps and Clips

LOS ANGELES
SAN FRANCISCO
SEATTLE
PORTLAND

JOSLYN PACIFIC CO.

Complete Pole Line Equipment

5100 DISTRICT BLVD., LOS ANGELES 11, CALIF.

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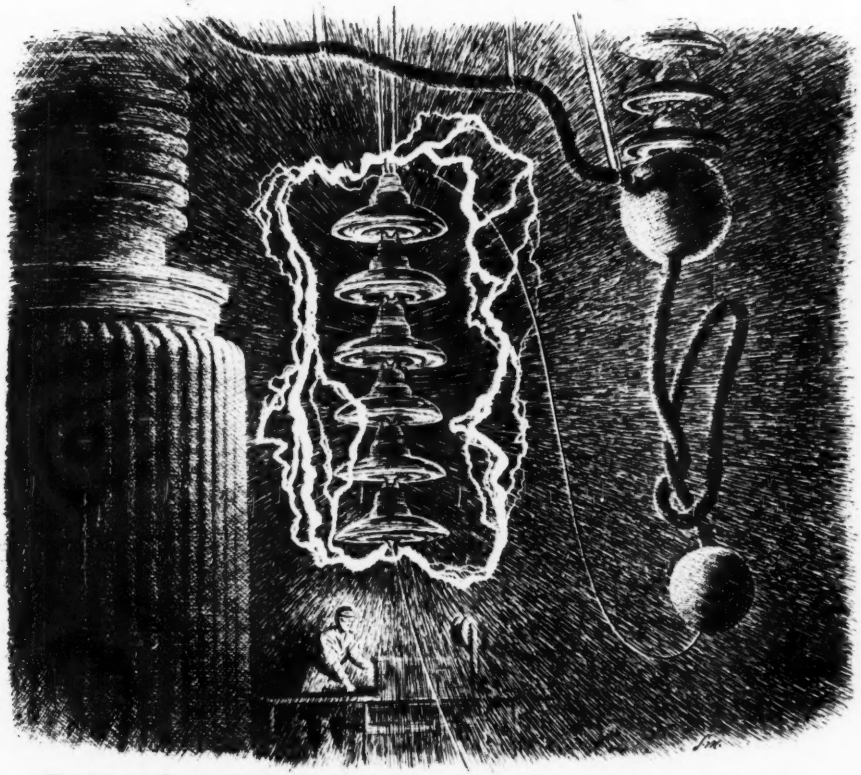
PROFILES

A "revolucione" ended the term of Art Bragg, General Electric Co. (blindfolded ready for execution, at center), as president of El Electric Club of San Francisco, March 7, and "Pauncho Esamolle," right of center (D. D. Smalley, PG and E), marched in with his insurrectos and took over. His "feefth column," Senor Ken Ryals, left, and George Tenney, right, engineered the coup d'etat. Senor Ignacio Borda, Okonite, left, next to victim, minister of interior, exterior and posterior, delivered the eulogy which Charlie Huyck, Graybar, unseen, translated into gringo. The revolt is a fait accomplis and the new order rules now

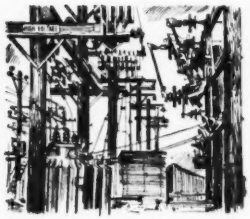
Illuminating indeed is the interest in Chinese luminaries displayed by Vice-President Ted Shepherd of Los Angeles left, and President Lee Tayler of Detroit (in Mandarin robe and Chinese cap) during the Illuminating Engineering Society conference in San Francisco, when a reception was given the officers at Forbidden City, famous Chinese night club. This shows the lighter side, as it were

to help keep your electric bill low . . .

P. G. and E. makes lightning in the laboratory



The sharp crack of a lightning bolt may seem out of place in a lab . . . but it's one of the many ways P. G. and E.'s Bureau of Tests and Inspection helps keep your electric bills among the lowest in the nation. Technicians give this "trial by lightning" to power-line insulators to make sure they won't cause costly breakdowns. High voltages are built up on one side of an insulator until the electricity arcs around it through the air...a miniature lightning flash. If the insulator "punctures" or if the flash comes too soon at too low a voltage, the insulator is rejected.



The life of power poles depends on rot preventives below ground. P. G. and E. tests these, too . . . along with thousands of other things such as the breaking strength of cross-arms and the conducting efficiency of the wire they support.

Lower electric bills and dependable service are the result of these and other tests. They all add up to longer lasting, harder working, more economical materials in P. G. and E.'s generat-plants and transmission lines.

Work never stops on our power building program

P · G · and E · PACIFIC GAS AND ELECTRIC COMPANY

EW-104-449

ADEQUATE WIRING hits the sales target!

Adequate Wiring is one of your best aids to consistent appliance sales—your target for today, tomorrow and the day after that.

In the adequately wired home, appliances operate at peak efficiency to lighten housekeeping tasks, and to provide pleasure and entertainment. And facilities are already in place for installation of *additional* appliances without troublesome alterations. Translated into selling, this means *satisfied customers* for what you have sold, and *likely prospects* for further sales.

You are aiming at just one thing: appliance sales. And you'll find that the promotion of Adequate Wiring helps you hit the target more often!

PACIFIC COAST ELECTRICAL ASSOCIATION

447 Sutter Street, San Francisco 8, California

601 West Fifth Street, Los Angeles 13, California